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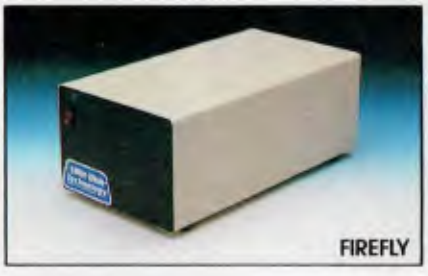

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CONTENTS

NEWS 7

SPECIALS 18

The Deep Blue Past ____ 18
Blueprints ____ 22
True Blue ____ 31
Blue Boxes ____ 37
Soft Blue ____ 45

BUSINESS 71

Medium Blues for Decentralised Computing ____ 72
Anyone for a Blue Rinse? ____ 74
Viatel Grapevine ____ 79

PROGRAMS 83

A magazine in itself. Pull it out — it's got its own binding, so it won't fall apart!

FEATURES 117

PC of the Year: Users' Choice ____ 118
The Great Database Search: Condor ____ 120
Public Domain Software for the PC ____ 128
Programmer's Workbench ____ 134

INSTRUCTION SET 147

Structured Programming — Part 2 ____ 149
How to Write for 'Your Computer' ____ 155
dLast of dBase ____ 163

PUBLIC DOMAIN 171

Q & A ____ 172
Your Blue ____ 173
Your Microbee ____ 175
PAMS News ____ 176
Your OS ____ 179
Your BBC ____ 181
Classifieds ____ 183
Lotus Hotline ____ 184
Books in Brief ____ 186
Glossary ____ 189
Services and Ad Index ____ 193
Next Month ____ 194

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YOUR COMPUTER is published monthly by the Federal Publishing Company Pty Ltd. Printed by ESN – The Litho Centre, Waterloo 2017, phone (02) 662-8888.
Editorial and NSW Advertising: 140 Joynton Avenue, Waterloo 2017. Telex: FEDPUB AA74488.
Typeset by Frontier Technology, Spit Junction NSW; phone (02) 960-2788.
Distributed nationally by Gordon & Gotch. Registered for posting as a publication – Publication No. NBP4384. See 'Public Domain' section for information on copyright, contributions, reader services and subscriptions.
*Recommended and maximum price only.
ISSN 0725-3931.

EDITORIAL

Grey Market

The Grey Market is not the result of the high disposable incomes of elderly Australians. Instead, it's a point of dissension among importers of software products.

Several companies have obtained exclusive distribution rights to the products they import. That means the original manufacturer will not appoint another distributor in competition with the first, but in order to justify this exclusivity the distributor has to uphold the good name of the manufacturer in this country.

This is done, in the main, by offering after-sales support, by taking out high-quality local advertising featuring the products in question (image-building, in other words) and in some cases by manufacturing locally. The expensive part of the deal is the after-sales support; you would not believe how much it costs to answer even apparently simple queries.

Now, while the United States principal may not directly supply other Australian distributors, he will, of course, supply wholesalers in the United States, and there's nothing to stop *them* reselling to Australian companies. This has given rise to the so-called 'grey market' of mail-order companies which import products from America and resell here at lower prices than the master distributors.

While low prices are certainly attractive, they are not the only thing to consider when deciding where to buy a software package. Bear in mind the level of support you will receive from one of these outfits is generally lower than that from the 'exclusive' distributor; they simply cannot afford a high level of support on their profit margins, nor do they have access to the official support channels of the manufacturer.

The grey marketers have been successful to the point where they are affecting the profits of official distributors — not just the large ones, but some smaller companies too. The question is, what to do about it.

Any attempt to restrict supply of products to only the master or exclusive distributors would probably fall foul of the Trade Practices Act, as a restriction of trade, rather like retail price maintenance. Indeed, one has to say we live in a mixed economy, in which legislative intervention in this kind of situation is frowned upon.

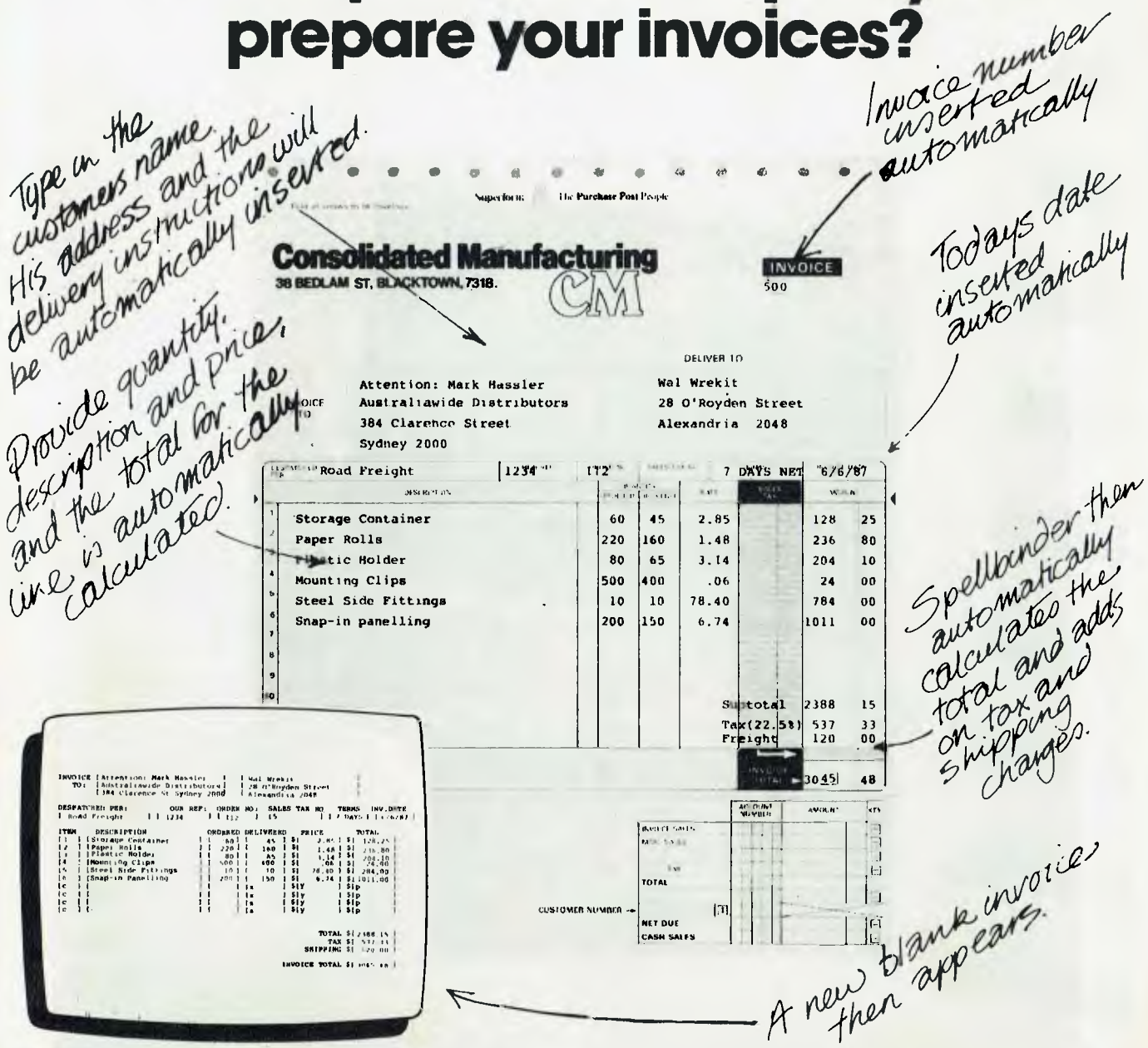
As I see it, the only thing software suppliers can do is educate the public to consider the long-term implications of their purchase, as well as any short-term benefit such as price. If you buy from a grey marketer, you risk being left high and dry when something goes wrong later or if you have trouble installing the package. On the other hand, if you are technically sophisticated and can cope with your own problems, you may be happy to assume the risk.

There are no sharp distinctions; there are master distributors whose support is, well, lacking, just as there are grey marketers whose support is excellent. Which you will strike is difficult to predict. But at least think about the risks of buying a package at a heavy discount.

LES BELL

Cover photo: Wayne Holloway, Exposure Increase.

When was the last time a wordprocessor helped you prepare your invoices?



Helping you prepare invoices is just one way Spellbinder wordprocessor and office management system can be speeding paperwork through your office. Spellbinder is the most talented and easiest to use CP/M wordprocessing system. Facilities which the others sell as extras, like mailmerging and sorting are standard features on Spellbinder. And because they are fully integrated they're quicker and easier to use. And that's just the start. Spellbinder comes complete with a series of powerful built-in application programs which are easily tailored to perform office tasks like invoicing, reports and calculations.

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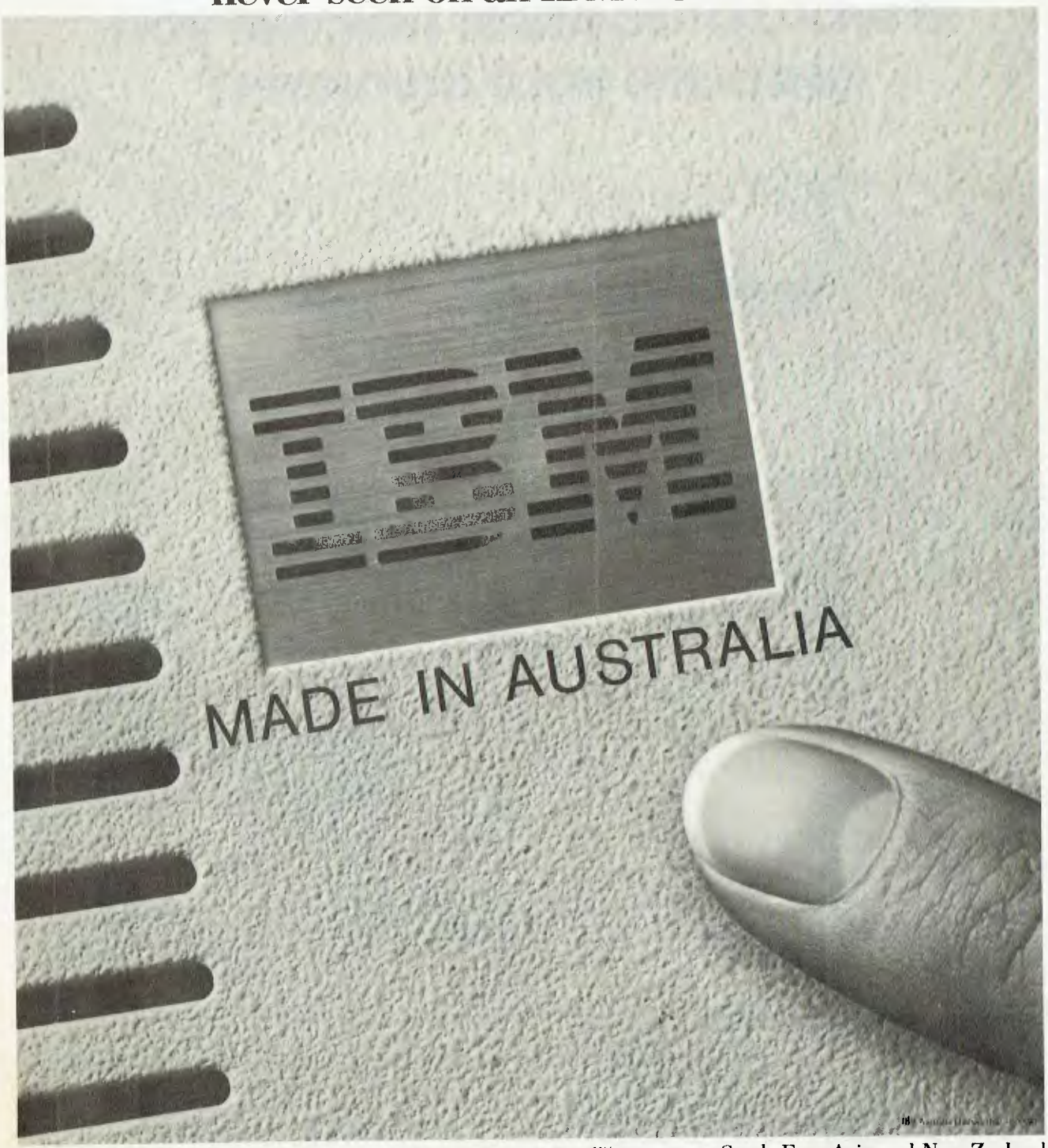


Until now there were just two places in the world where we could build you an IBM Personal Computer.

Florida, USA. And Greenock, Scotland.

Now there's a third. Wangaratta, Australia. Having achieved such high levels of quality and efficiency producing typewriters at Wangaratta, it was a natural choice.

The production line has been installed.

And the first Australian PC's are already coming off the line.

Not all of them will be made for Australia however.

Thousands will be shipped to South East Asia and New Zealand every year.

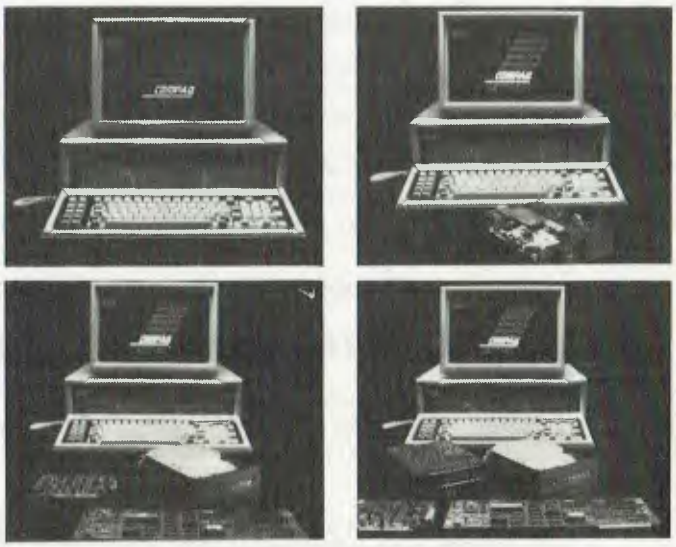
Giving Australia a valuable new high technology export.

It's recognised that Australia needs to be involved in sunrise industries like computers.

We're only too happy to be lending the sun a hand.

Way Forward is 'Innovation Within Industry Standards'

Compaq Computer Corporation has had stunning success in the US market, and has just introduced its family of Deskpro machines to Australia. Compaq's chairman Ben Rosen, a venture capitalist of some renown (he was a primary backer of Lotus Development Corp), was in Australia recently to deliver the keynote address for the Personal Computer Conference.



COMPUTER INDUSTRY directions from 1985 will include continuing research into 32-bit processors, larger storage capacities on both hard disks and floppies, streaming tape drives as essentials for backups of large applications programs, and considerable improvements in high-resolution graphics for business, according to Ben Rosen in his address to the Personal Computer Conference.

An area ripe for development is the 'user interface'. At present microcomputers are too difficult for most users to handle. Said Rosen, "As processors get more powerful, we will see improvements in the person/machine interface." Rosen believes applications for Intel's 82386 processor, which should have considerable communications and multi-tasking potential, will be available within about two years.

General industry directions will continue to be determined by the actions of IBM, said Rosen. Companies trying to set different standards from those developed by IBM will face a very difficult task. "IBM has set a standard with its Personal Computer which will dominate the market for several years to come, and by its adoption of open architecture for its products has attracted developers around the world."

Innovation Essential

Rosen believes the way for other companies to succeed will be to innovate *within* the IBM standard. "This is absolutely necessary. A manufacturer cannot wait until IBM brings out a computer and then copy it." A primary goal would be to produce software which could run on any machine within the standard. In addition, improved performance or capabilities which differentiated a machine from IBM would be needed for a product to be viable.

Compaq, the company of which Rosen is chairman, has done exactly that in developing its IBM-compatible family of microcomputers. In an industry which has seen companies rocket to the heights (and plummet back to the depths) in remarkably short periods, Compaq Computer Corporation stands out from the crowd of high fliers. Founded in February 1982, the company raised a record $US30 million in venture capital, went public in December 1983 and in that same year had revenues of $US111.2 million — the most successful first year of sales ever in American business history.

In its first year of production the company shipped two products: the Compaq Portable and the Compaq Plus Portable, both full-function, high-performance IBM compatibles. In 1984 the Deskpro family of desktop computers was introduced in the United States — the first to combine an 8086 microprocessor with full compatibility with the IBM PC, XT and AT.

The Deskpro Family is now available in Australia through the Computerland chain of stores. Each model features a three-piece design consisting of the 8086-based system unit, a keyboard and a unique dual-mode monitor which runs both high-resolution text and graphics on the same screen. The series starts with Model 1, which includes 128 Kbytes of RAM, one 360 Kbyte 13 cm drive and six hardware expansion slots. The top-end Model 4 has 640 Kbytes of RAM, one 360 Kbyte drive, a 10 Mbyte fixed disk drive and an internal fixed tape-drive backup system.

One of the main causes of incompatibility between the IBM and computers based on the 8086 chip is that the 8086 operates at almost twice the speed of the IBM's 8088 processor. This causes problems with timing-dependent programs, such as communications packages, tutorials and games. Compaq has circumvented this problem by equipping its computers with two speed modes, one to operate software at the 8 MHz 8086 rate and the other to run programs at a simulated 8088 4.77 MHz rate.

By including such design enhancements and maintaining the philosophy of improving on Big Blue's standards, Rosen believes Compaq is steering the right course for survival in the microcomputer market of the eighties. □

SYNERGISE WITH US

Your Computer is instituting synergistic beer drinking, a custom which gained popularity and notoriety when Les Bell was editor of *Electronics Today International*.

Why synergistic? Synergy is the co-operative action of two or more stimuli, a reaction in which the sum of the whole is more than the sum of the parts. *Why beer drinking?* Any excuse. *What does it mean in practice?* An occasion for you to come and talk with the staff of the magazine, share information, rumours, ideas and a drink or two.

The first session is on May 1 at about 6 pm at the Clock Hotel, 470 Crown Street, Surry Hills. If you can't make it that night, we will be synergising the first Wednesday of each month from May onwards, same time, same place. Just turn up and look for the table with the computer magazines and dapper-looking programmer/journalist types. That's us. □

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Sue Robinson, the *AUSTRALIAN.*

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COMPUTER MONITORS THE FAMED ORANGUTAN TWINS

The Royal Melbourne Zoological Gardens has become Australia's first animal park to install a computer. The machine installed is an Australian-designed Spectrum from local minicomputer manufacturer Webster Computer Corporation.

The Spectrum will be used to monitor and report on accounting and inventory, recording over 100 species of animals, 215 birds and 75 reptiles and amphibia. Such well-known individuals as Mzuri the baby gorilla, the orangutan twins Bono and Suma and giraffes Donald and Matilda will be among those to have their personal details such as birthdays, parentage and general health recorded.

The installation, which will cost $150,000 when complete, is expected to streamline administration in its methods of reporting and provide a higher standard in animal health care and selective breeding. IDAPS Australia has supplied its Starfire software package to cover general accounting and keep an inventory on the status and numbers of creatures within each species. The package which will monitor the animal records of parentage, breeding patterns and medical history is at present being developed by McNaught Computer Services using the fourth-generation CUPID language. □

TRIPLE MODE COMMODORE

Two additions to the Commodore range of computers were announced at the Personal Computer Show. Commodore is hoping the two machines, the C128 and the PC-10, will make serious challenges in their respective markets.

The Commodore 128 supposedly offers triple value with three modes of operation. The first is C64 mode, which gives compatibility with C64 software. Next is a CP/M mode which lets you use the wide range of software available under CP/M. Finally, there is C128 mode, which lets you choose between 40 and 80 columns, use BASIC Version 7.0 and use the 8500 processor.

The Commodore 128 comes with 128 Kbytes of RAM and can be plugged into a television or monitor.

The PC-10 is designed to be a direct competitor with the IBM PC. The company claims it offers all the power of the PC and full compatibility, with a considerable price reduction.

Prices have not yet been finalised, but Commodore has suggested the C128 will sell for around $599 ($999 with a single disk drive). The PC-10 should sell for about 15 per cent less than the IBM PC. Release dates are also still mere rumours, but June seems likely for the PC-10 and the C128 should be out in August.□

AUSGRAPH SEEKING BROAD BASE

Australia will this year host its first international conference and exhibition on computer graphics. Ausgraph '85 is being held from August 12-16 in Brisbane, organised by the Australian Computer Graphics Association (ACGA).

The conference will cover all areas of computer graphics, including animation and graphic arts, business graphics, exploration and mining, architecture and engineering, cartography and mapping, advertising, image processing, printing and publishing, video games and education, case studies, programming and industry trends.

Speakers will include Australia's top experts in these fields as well as authorities from the United States, Europe and Japan. Delegates will have many opportunities to meet with the speakers during the varied social program of Ausgraph '85.

The exhibition will feature equipment ranging from microcomputer-based graphics to systems from the largest users. The organisers are setting aside space for people who have developed their own graphics packages at home or on a very small scale, and invite such people to contact them to reserve space in the exhibition venue.

In conjunction with the exhibition and conference, ACGA is holding a computer art contest. Works submitted may be on printout or recorded on photographic media and should be accompanied by the entrant's name, address and a statement of the equipment used. The cost of the equipment used will be taken into account by the judges, who will place emphasis on the originality and expression of the overall composition, rather than special effects generated by the hardware.

Selected entries will be put on display at the Ausgraph exhibition. The winning entrant will receive an expenses-paid trip to the conference in Brisbane (Brisbane entrants may opt for a trip to Ausgraph '86 in Sydney). Other prizes will be awarded at the Ausgraph committee's discretion, including a $200 voucher for the best school student entry. Employees of computer graphics vendors and suppliers may submit entries for the exhibition, but will not be eligible for the prizes.

Entries, postmarked no later than June 15, should be sent to Computer Art Contest, Ausgraph '85 Secretariat, PO Box 29, Parkville 3052. Any enquiries about the conference should also be addressed to the secretariat, or made by phone on (03) 387 9955.

APRICOT RANGE EXTENDED

Barson Computers has bombarded the computer market with not one, but four new Apricot computers. Adding to the existing Apricot PC and Apricot XI hard disk units are the low-cost F1 (Friendly One — yech), the Apricot Portable, the Apricot .7 and the Apricot .32.

The F1 is designed for the new business user. It is based on the Intel 8086 16-bit processor and can run either MS-DOS or CP/M. A notable feature is the cordless keyboard — the system uses an infra-red device effective at up to two metres. IBM used a similar device with its PC junior without much success, so it will be interesting to see how the F1 performs. It retails for $3135.

The Portable is also 8086-based. It weighs 5.8 kg and includes an 80 by 25 line LCD display, 272 Kbyte RAM and a 64-word speech recognition system. Software provided is MS-DOS 2.11 and the price is $4725.

The Point 7 is a cluster control unit for people wanting a small multi-user system. It will support seven users and allows Apricot, Sirius and IBM PCs to be linked in the system. The Point 32 is a local area network (LAN) controller — a system which acts as a file server with a 10 Mbyte Winchester disk for up to 32 Apricot or Sirius computers.

For more information, contact: Barson Computers, 335 Johnston Street, Abbotsford 3067; (03) 419 3033. □

WHO MAKES MAGNABIZ?

In our April issue we made an error in listing the manufacturer of Magnabiz, one of the finalists in the Australian Software section of the Personal Computer of the Year Awards.

Magnabiz is a simple accounting system designed for small businesses. Magnasoft, which was listed as the manufacturer, is actually one of the distributors of the package. Magnabiz was written by Eric Ackroyd, and is produced by Ilehead Pty Ltd. Ilehead can be contacted at PO Box 510, Chatswood 2067; (02) 412 3470. □

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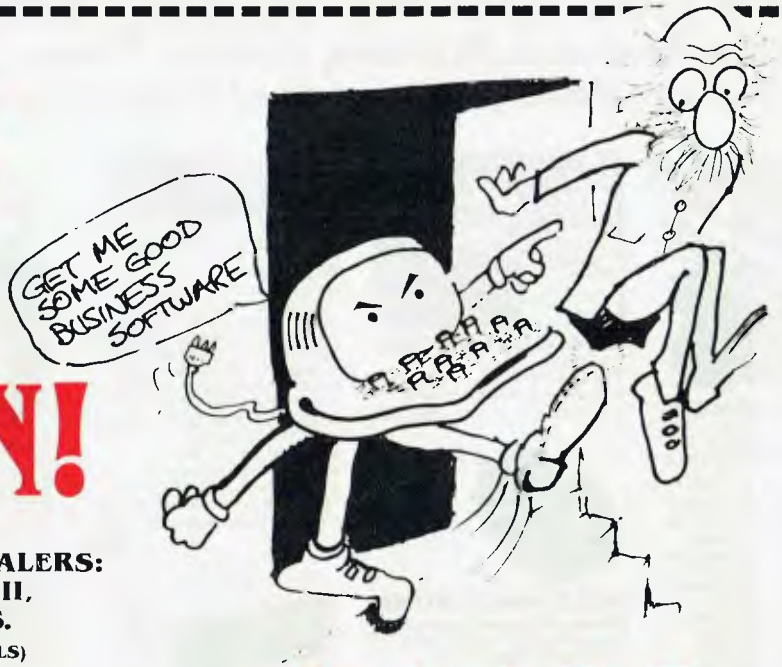

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MICROBEE ENHANCER 1

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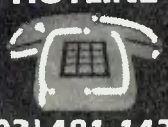

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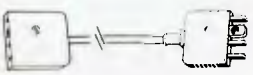

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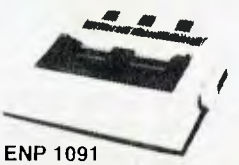

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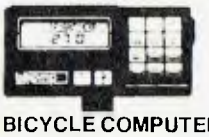

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HP RELEASES UNIX-BASED INTEGRAL

A high point in a rather dull Personal Computer Show was the appearance of Hewlett-Packard's Integral Personal Computer. Designed principally for the university, scientific and engineering markets, the Integral combines a number of distinctive features, both externally and internally.

Not the least of its distinctive features is the appearance of the machine — it looks something like a bulky portable cassette recorder. The 11 kg package includes a 23 cm bit-mapped amber electro-luminescent display and a built-in Thinkjet printer. Electro-luminescent displays demonstrated their superiority at the show, with many of the LCD screens on various portables almost unreadable under the display lighting. There was no such problem with the Integral's display.

The machine is built around the Motorola 68000 16/32-bit processor and a 16-bit HP graphics processor. The operating system is HP-UX, HP's version of Unix System III. Standard memory includes 512 Kbytes RAM, 32 Kbytes display RAM and 256 Kbytes ROM. The ROM holds the operating system, HP Windows and the Personal Access Manager (PAM) file management system.

Software to be available for the Integral includes HP-UX technical BASIC, HP-UX C, and applications for personal computer-aided design, mathematics/statistics, database management, project management, communications, spreadsheet and word processing. The price is $8580 (excluding tax) and it is available directly from Hewlett-Packard: 31-41 Joseph Street, Blackburn 3130; (03) 895 2895. □

PRICES ON THE WAY UP

Trying to get fixed prices on computers and software is almost impossible at the moment. The strength of the US dollar in recent months has forced prices up on almost all imported goods, causing some local distributors to make almost weekly decisions on their pricing.

Two of the companies which have announced price rises are Microsoft Australia and Arcom Pacific. Microsoft has announced increases of 10 per cent on many of its products. MS-DOS Multiplan is now $325 and Word for the Macintosh is up from $295 to $325. Arcom Pacific has increased prices on most of its range by about 12 per cent, with dBase III up to $976 from $796, Framework $1009 (up from $795) and Concurrent PC-DOS $519 (up from $419). □

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TERMINAL, MODEM AND PHONE IN ONE

While a number of companies have been touting mice as a means of getting busy executives interfaced to computers with a minimum of fuss, Telrad, an Israeli communications firm, has been developing what it calls a 'smartphone'. No, no, this isn't just another tarted up version of Alexander G. Bell's original no-frills invention; the Info 4000 is a touchscreen terminal, designed to present all the useful information in your company's computer in an easy-to-access form — *and* it incorporates a bells-and-whistles, dual-line phone with a built-in modem.

Intended for executives who don't have time to spend learning about computers, computer commands, and how to get meaningful information from their company's data banks, the Info 4000 system apparently requires only a few hours' coding to produce the user's information needs. Marketing results, cashflow, month-to-date sales, statements, inventory reports, corporate balance sheets can all be generated and displayed in a form to suit the user.

The phone's inbuilt modem also allows users to hook into any other public or private computer they may work with. Using various databases and public information bureaus, you could, for example, display airline timetables, theatre performances, the balance of your personal account, the status of your investment portfolio or the latest stock market reports.

The Info 4000 terminal can store your list of telephone numbers so all you need do is press the number you want on the displayed directory and the phone will dial it.

Like manual dialling, the need for typing skills is almost eliminated with this kind of terminal, because information is presented in a form that makes access as simple as touching the screen. However, when you need to leave messages on another user's terminal, or interact with a public database, or perform any minor task using a keyboard, the terminal will display the qwerty layout on the screen for you to 'type' your message. Obviously this arrangement isn't practical for any but the briefest communications; for those who want to use a keyboard more extensively, say for utilising the host computer's word processing or spreadsheet capabilities, a detachable keyboard is available.

The best way to describe the appearance of the Info 4000 is 'unobtrusive'. It takes up minimum desk space (keeping in mind it also incorporates a phone), and you don't have to stand on your chair to be able to see what's going on in the rest of your office. Although below eye level, the terminal's screen is tilted upward for comfortable reading. The unit has a numeric keypad for manual dialling and some other keys for selecting phone functions and bringing up the onscreen keyboard.

Simplicity, said a Telrad spokesperson, was the key in designing the Info 4000; both externally and in its operation, it had to be a non-threatening machine.

Info 4000 costs around $2100 when purchased singly; when bought in quantities of five it costs $1975; larger orders attract further discounts.

For more information contact the product's Australian distributor, Sigma Data Corporation, at 157 Walker Street, North Sydney 2060; (02) 436 3777. □

EDITOR CURBS BAD HABITS

Microshare Systems, a Sydney-based software company, has released what it claims to be a revolutionary structured programming productivity tool for the IBM PC and compatible machines. Dubbed SpeedIt, the package includes a full-screen editor for 'flowblocks' — a squared-up form of flowchart — and a translator which converts groups of flowblocks into BASIC source code.

The editor encourages structured programming practices and is designed to support the creation and maintenance of programs of any size. "The program logic documentation now becomes the program," said a company spokesperson.

Programs written as flowblocks use BASIC syntax, but without line numbers or the GOTO command; GOSUB calls reference modules by name rather than by line number.

SpeedIt is aimed at the educational market and software developers. The package is available as a limited capacity demo version for $19.95; the complete version costs $79.95. Minimum hardware needed to run the program is an IBM PC (or compatible computer) with 256 Kbytes of RAM, one floppy disk drive (although a hard disk is preferable) and an RGB colour monitor.

MicroShare Systems can be contacted at PO Box 169, Milsons Point 2061 □

PC USERS' CONFERENCE

APCON '85 is the name of the inaugural PC users' convention, to be held in Sydney on September 3 and 4. It is hoped the conference will further the cross-fertilisation of ideas and strengthen ties between users.

Six key subject areas will be covered: spreadsheets, databases, word processing, languages, graphics and the future of PCs. Each of the subjects will be introduced by an authority in the area. Following the introduction, a variety of practical applications relevant to the subject area will be demonstrated by the users who developed them. The sessions will then be opened to discussion. The conference organisers are eager to hear from users who would like to present applications they have developed in a particular area.

APCON '85 is targeted at all people who use IBM PCs (or compatible systems) in their work environment. Attendance will be limited to 300 people, so it's worth registering early. Another inducement to register early is the concession registration fee of $135 for one day or $205 for both days if you get your application in before August 1. Normal registration will be $175 for a single day and $255 for both days.

More information from: APCON 85, c/o PC User Group, Box 5010, GPO Sydney 2001; (02) 663 3919. □

3M INTRODUCES RENTAL PLANS

Due to changes to a government accounting standard dealing with leases and rental, up to 40 per cent of business equipment leasing as we know it will be replaced by new-style rental agreements, according to John Moore, Information Systems Group Marketing Manager for the 3M Company.

In anticipation of a dramatic increase in demand for rental arrangements, 3M has launched its own rental plan, in conjunction with Centrelease. Under the plan, customers will be able to rent 3M's file management and engineering systems, facsimile, local area network and audio visual equipment for basic fixed terms.

Depending on market demand, 3M also expects to be offering rental plans for its other hardware — including healthcare, printing and security systems — in the near future.

3M is offering a choice of three rental plans. For more information contact: 3M Australia, PO Box 99, Pymble 2073; (02) 498 9333. □

LISP ON A CHIP

Texas Instruments believes the introduction of its Explorer advanced symbolic processing computer system will herald the commercial use of artificial intelligence technology in the office environment.

Unlike conventional computing which excels at repetitive algorithmic solutions with organised data, symbolic processing addresses unstructured problems, interpretation of information, use of 'rules of thumb' and dealing with uncertain or incomplete information.

Until recently, commercial development of AI systems has been restricted by the high cost of the hardware necessary to support efficient symbolic processing. Typical development systems have cost hundreds of thousands of dollars or more. The Explorer system is selling in the US for $US50,000 to $66,000, depending on the configuration.

The system is aimed at research institutions, government

departments, universities and software developers. It is available in six configurations, with an entry-level system consisting of a dedicated LISP processor, 2 Mbytes of memory, display, keyboard and mouse, one 140 Mbyte Winchester drive, LISP system software licence and a local area network interface or streaming cartridge tape. LISP (LISt Processor) is the predominant language in the artificial intelligence field.

At the microcomputer level, TI will be releasing its Personal Consultant package for the TI Professional Computer later this year. The Personal Consultant will enable users to develop expert systems utilising the LISP language, furthering the commercial viability of AI development work.

For more information, contact Jim Wright at Texas Instruments: 6-10 Talavera Road, North Ryde 2113; (02) 887 1122. □

FLASHPRINT!! FOR!! WORDSTAR!!

Despite being the best-selling word processor in the world, WordStar has a number of inadequacies. One of these is its inability to utilise the variety of control codes recognised by most dot matrix printers.

A new program from JRT Software, called Flashprint!! (one exclamation mark would seem *more* than enough), lets you control all aspects of printing style, from changes of typeface to producing bit-image graphics, from within your WordStar documents.

Flashprint stores up to 3200 bytes of codes in a file; when printing a file containing Flashprint control symbols, this table is used for reference to produce the desired effect. To use Flashprint, you simply run it *instead* of running WordStar; WordStar will be loaded automatically.

Flashprint will run on most CP/M-80 machines and on Apple computers. JRT Software is handling the distribution of Flashprint for all machines except the Apple. Cost, including postage and handling, is $48 for 13 cm single-sided disks, or $58 for 20 cm or 13 cm double-sided double density disks. Orders should be addressed to JRT at 42 Turners Avenue, Coromandel Valley 5051.

Thinking Systems is distributing Flashprint for the Apple II, II+ and IIe. For this version the price is $59, and more information can be obtained from: 29 Belmore Street, Surry Hills 2010; (02) 211 0944. □

COMPUTER AIDED HEALTH PROGRAMMES

Although microcomputers are more often renowned for their part in *causing* occupational health problems than curing them, a recent safety seminar in Perth was told that the introduction of personal computers has brought computerised occupational health programmes within reach of many new businesses.

The seminar was organised by the Industrial Foundation for Accident Prevention (IFAP), an independent non-government body which assists industry to reduce workers' compensation costs and to increase productivity by reducing hours lost through occupational injuries and illnesses.

Managing Director of Scientific Information Retrieval, Maureen Reardon, told the seminar microcomputers offer an economical way of obtaining occupational safety information. "Access to worldwide data banks is inexpensive and an excellent source for finding out about potential hazards of any new chemicals or materials used in the workplace," she said. □

WRONG TURBO

In the Commodore column of our January issue, a program which converts disks to a new format enabling programs to load around five times as fast as usual was mentioned. The program was called Turbo-DOS in the article—in fact this is the name of a CP/M-like operating system from the US company Software 2000. The disk conversion program mentioned is actually called Turbo-64, and is marketed by Cockroach Software, P.O. Box 1154, Southport 4215. □

BRIEFLY

■ Data Base Management Services has released a demonstration package of the KnowledgeMan database for $25 and an evaluation package for $35. The evaluation package comes with the 350-page tutorial book Discovering KnowledgeMan. For more information contact: Peter Smith, Suite 6, 83 Glen Eira Road, Ripponlea 3183; (03) 523 5947.

■ Semiconductor and computer manufacturer Texas Instruments put in a record year in 1984 with sales of $US5.7 billion and a net profit of $US316 million. The company's profit followed a 1983 loss of $US145.4 million, brought about by problems in the home computer market and the company's subsequent withdrawal from that market.

■ The University of NSW is broadcasting another in its series of Radio University programming courses. 'BASIC Programming for Personal Computers' is a 15-lecture series in two parts. The first seven lectures are applicable to most microcomputers, while the final eight are devoted to programming on the Apple II family. The series starts on June 4 and costs $35 for Part I and $40 for Part II. Details from: Radio University, PO Box 1, Kensington 2033; (02) 697 3175.

■ A new version of Dataflex is now available (Version c2.1A). Improvements include increased file size limits and number of records per file, extensions to the command language, a special IBM PC version and multi-file query facilities. More information from: Australian Microcomputer Solutions, 248 Latrobe Terrace, Geelong 3220; (052) 21 1200.

■ In answer to criticisms of LCD screens, Osborne has added a monitor port to the Osborne 3 Ultraportable and increased the contrast of the existing screen. Also included in the new version is a ROM-based Electronic Diary and Scheduler. The basic Ultraportable sells for $3431. Contact Osborne for more details: 93 York Street, Sydney 2000; (02) 290 1122.

■ Interactive Applications has released a new software package for the Macintosh called Front Desk. Front Desk is designed for situations where the cost-effective control, scheduling and management of people and resources is important. The product will be distributed through authorised Apple Macintosh distributors, with a recommended licence fee of $249.

■ QNX 2.0 is a new multi-user, multi-tasking Unix derivative which is claimed to work 20 times faster than Unix. It operates in as little as 128 Kbytes of RAM and integrates local area network architecture into the heart of the operating system. For more information contact: Kinetic Systems, 357 Nicholson Street, Carlton 3054; (03) 347 7326.

■ Because of the large attendance at meetings in recent months, the Sydney Microbee User's Group has had to move to a larger venue. Meetings will now be held at Strathfield Girls' High School from 1 to 5 pm on the third Saturday of each month.

■ In our April issue we listed Software City of Blacktown, NSW, as the distributor of Sidekick, one of the finalists in the Software Product of the Year awards. Arcom Pacific also distributes this product. Arcom can be contacted on (07) 52 9522.

■ If you're interested in data communications products, putting yourself on Datacraft's Black Box mailing list will ensure you receive regular releases of the Black Box Catalogue — typically around 130 pages of low-cost cables, modems, MUXs, protocol converters, switches, tools and reference books. To register, ring Datacraft on its toll-free number (008) 33 7053, or write to PO Box 353, Croydon 3136.

■ Computer Country, the distributor of Milk Manager, reviewed in our February issue, has folded. The new agent for the program is Leslie Winterburn, Suite 1, Carlino Community Centre, Prinderville Drive, Wanneroo 6065; (09) 409 1920.

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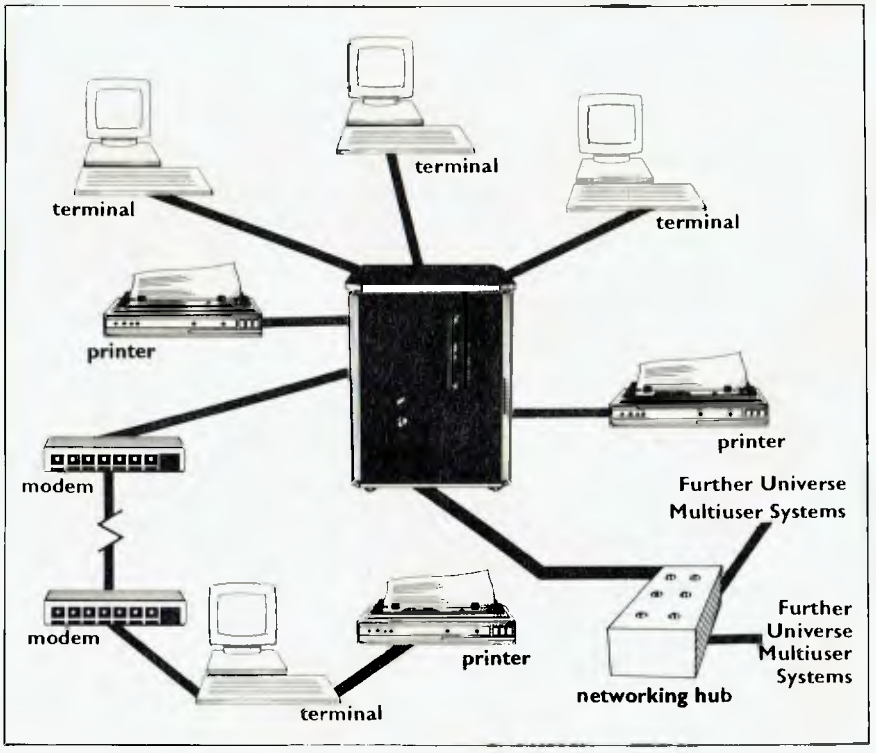

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VIC: AED Computers (Melbourne). 53 Waverley Rd., East Malvern 3145. Ph: (03) 211 5542 Telex AA 30624

WA: Computer Services of WA. 465 Canning Highway, Como 6152. Ph: (09) 450 5888.

THE DEEP BLUE PAST — IBM In Retrospect

Frank Lee hops into his creaking time machine, and seeks out the roots of Big Blue, the giant international corporation behind the most popular microcomputer ever.

Affectionately known to the cognoscenti as 'Big Blue' for many years (perhaps because of its pre-eminent position on the stock exchange), international giant IBM has more recently taken on a decidedly new image.

Random samples of school age children attest that they know of IBM as the company behind the most popular personal computer ever released. So do many of their parents and teachers.

Less than ten years ago, film goers were educated to consider the term 'IBM' as synonymous with 'computer'. Kirk Douglas would grunt "Let's run it through the IBM", and the cameras would pan to a row of 2400 series magnetic tape drives all ashudder. IBM always meant Big Computers. Big and Expensive. Where did it all go?

Well, of course, it didn't go. It's still there in strength. It's just that the average person gets to see the high volume, relatively low cost IBM Personal Computer. The public image has changed accordingly.

For many years IBM has commanded about 60 per cent of the total world computer market. So to some old timers, the present preoccupation with the IBM-of-the-PC seems slightly out of whack. IBM's revenue from the PC in 1984, although only a few per cent of its total corporate earnings, nevertheless surprised even IBM itself.

This article briefly traces the origins of IBM, and attempts to draw together the diversity of interest which has marked the giant's growth since its formation in 1911.

Outstanding Individuals

IBM, both in its early beginnings, and indeed to the present, has been marked by the contributions of outstanding individuals. While today's IBM research workers are far more numerous and better equipped, they still include brilliantly inventive minds which thrive in the heady 'pure' atmosphere of research endeavour.

Perhaps the most notable name from IBM's past is that of Herman Hollerith. In a day when 'computer' meant 'one who can compute', and 'digital' was defined as 'belonging to the fingers', Hollerith laid much of the groundwork for today's computer industry.

Drawing upon the inventiveness of one M. Jacquard, who patented a punched-card-driven loom in 1801, Hollerith designed a system of punched card devices to process the US Census of 1890. Designed in collaboration with James Powers, this punched card tabulating machine sensed holes in the cards electrically. In the census, the position of holes, or combinations of holes, stood for personal characteristics or numbers. Other devices designed by Hollerith included card punches, sorting machines and collating devices. The previous census of 1880 took seven years to process manually. Without the punched card, it was estimated that the 1890 census would have taken 20 years to complete! Instead it took just three years.

A cantankerous perfectionist, Hollerith began an unbroken chain of development that would continue to the electronic era. In 1911, his company and two others merged to form the Computing-Tabulating-Recording Company, the name of which was changed in 1924 to International Business Machines Corporation. Hollerith, who stayed on for another ten years as a consulting engineer, was soon joined by other highly talented inventors.

One of these was Clair Lake, affectionately known as 'Mr Accounting Machine', whose numerous inventions spanned 30 years with IBM. Perhaps his major contribution was the printing tabulator which created 'hard copy' — a long cry from reading the needles on the Hollerith tabulator. This single invention is considered to have saved the company from extinction by Remington Rand, which had absorbed the business established earlier by James Powers.

A Patent A Day . . .

A slightly later punched card era inventor was the Scotsman James Bryce. He accumulated over 500 patents, averaging one a month! As far back as 1915, Bryce foresaw the potential of Forest's new electronic vacuum tube as the means for high-speed numerical calculation. In 1932 he instituted successful research projects to develop electronic methods for performing arithmetic operations.

By the mid '40s IBM engineers had developed hundreds of punched card devices, or 'unit record' equipment. Meanwhile Prof. Wallace Eckert devised ingenious techniques to apply unit record equipment to scientific research. In doing so, he helped to unite the work of scientists, who supplied the theory of computing, with the practical knowledge of engineers and mechanics. Eckert joined IBM as its first director of pure science in 1945.

In late 1937, a physics student at Harvard University named Howard Aiken approached Bryce to discuss the possibility of an automatic calculating machine. In 1939 IBM and Harvard signed an agreement to develop the machine later to be known as the Harvard Mark I, the forerunner of today's electronic computer. Although far from today's computer in concept, it marked the beginning of the 'information age'. Shortly after its completion in 1944 it was presented to Harvard University by IBM, and was put into

Aurora Borealis–in blue ... *Photo: Horizon/Robert Estall*

round-the-clock operation for roughly 15 years. It was retired in 1959 to become a museum piece.

The Mark I was a toy by today's standards, having just 72 arithmetic registers (of 23 decimal digits precision) and no means for internal program storage. Input was by means of manually operated switches, or from punched cards. Output appeared on electric typewriters or as punched cards. The principal electronic component was not the electronic vacuum tube; rather it was the humble relay which formed this machine's backbone.

There's A Bug In My Wiring

Other machines followed in rapid succession in the next decade. Notable amongst these was the ENIAC, a vacuum tube-based machine which was programmed by modifying its external wiring. ENIAC was Aiken's Mark I in vacuum tube form. Although pitifully limited by today's standards, it cost about $500,000 and occupied a vast room. Sadly, although the notion of a stored program had been put forward almost 100 years earlier by Charles Babbage, the ENIAC failed to take advantage of that concept.

The first successful stored program machine was EDSAC, attributed by many to the concepts of John von Neumann.

From 1947 electronic computers began to proliferate. In 1948 IBM announced its small commercially available electronic calculator known as the 604. About 4000 were constructed until their demise in 1960. IBM's CPC (Card-Programmed Calculator), released in the late Forties, executed instructions on a 604 using programs read from punched cards. Its output was printed on a standard IBM 407 tabulating machine. The influence of unit record equipment on the design of computers was profound.

IBM engineers started to right the balance between storage speed and processing capability in the early '50s. While ferrite core memory systems were developed outside IBM, company engineers were the first to develop core memories for the SAGE air defence system in 1952 in conjunction with MIT's Lincoln Labs.

IBM's commercial 704 and 705 computers announced in 1954 resulted from techniques developed in the design of the SAGE system. Further research made the core memory more reliable and cheaper. Cores became smaller and faster, until in 1965 when IBM announced its 360/65, four bytes could be accessed in better than 500 nanoseconds. ▷

BEHIND BIG BLUE

The electronic vacuum tube soon became a museum piece in the wake of the transistor, developed by Bell Labs in 1947. In 1961 IBM introduced its Stretch computer with 150,000 individual transistors under its covers. The most powerful computer of its day, Stretch could perform over 100 thousand computations each second (or, in today's jargon, 0.1 MIPS).

Individually mounted transistors were soon replaced by integrated assemblies. IBM's 360/50 (1963) used thousands of ceramic modules known as SLT (Solid Logic Technology) devices. Circuits were closely combined on half-inch ceramic bases using printed circuit technology. Each SLT device might have half a dozen or so individual transistors and resistors in a variety of configurations.

SLT marked the beginning of miniaturisation. The next jump was a major one — from SLT to integrated circuits in which all of the components — transistors, diodes, resistors — were fabricated on a single sliver of pure silicon crystal. The resulting 'monolithic' technology spanned the Seventies, passing through various stages of microminiaturisation until it became possible to fabricate a complete CPU on a single chip. But that, of course, is recent history.

More Than Just Machines

IBM is more than machines. It has also had a major role in the development of software tools and application programs.

My aged uncle Phil recalls attending an IBM class on a newfangled language called FORTRANSIT (!) in the late Fifties. This language (closely followed by the FORTRAN family) had its roots in earlier IBM languages known as SOAP and IT.

Today there are more than 200 programming languages, most of them designed for highly specialised applications. Some have a more general appeal. Notable amongst these are COBOL and BASIC. PL/I, developed jointly by IBM and some of its customers in 1964, was a fine attempt to bridge the gap between commercial and scientific programming. (Les Bell and I still think it's a great language).

Equally important in its contribution to computing practice are the operating systems developed by IBM. Perhaps the best known, least loved, and most maligned is OS/360 developed for the 360 series in the early Sixties. Many of us curse the obscurities of PC-DOS; how well off we are! But in spite of the opacity of OS/360 (and OS/370 for that matter), these are very powerful systems. And power always has its price.

IBM has traditionally designed and made all its own subcomponents. The integrated circuits and software have all originated from the IBM stable.

How strange, therefore, it seems when we now contemplate the IBM PC. Things have indeed changed in the corporate giant. More than a new micro, the IBM PC represents a major shift in corporate policy. The CPU is a chip designed by Intel Corp. The operating system hails from Microsoft. The disk drives come from just about any supplier who can meet IBM's rigid specifications.

This is the new look of IBM. Adaptability in the most rapidly developing marketplace the world has ever known. Is it any wonder that it still retains its 60 per cent grip on that market? □

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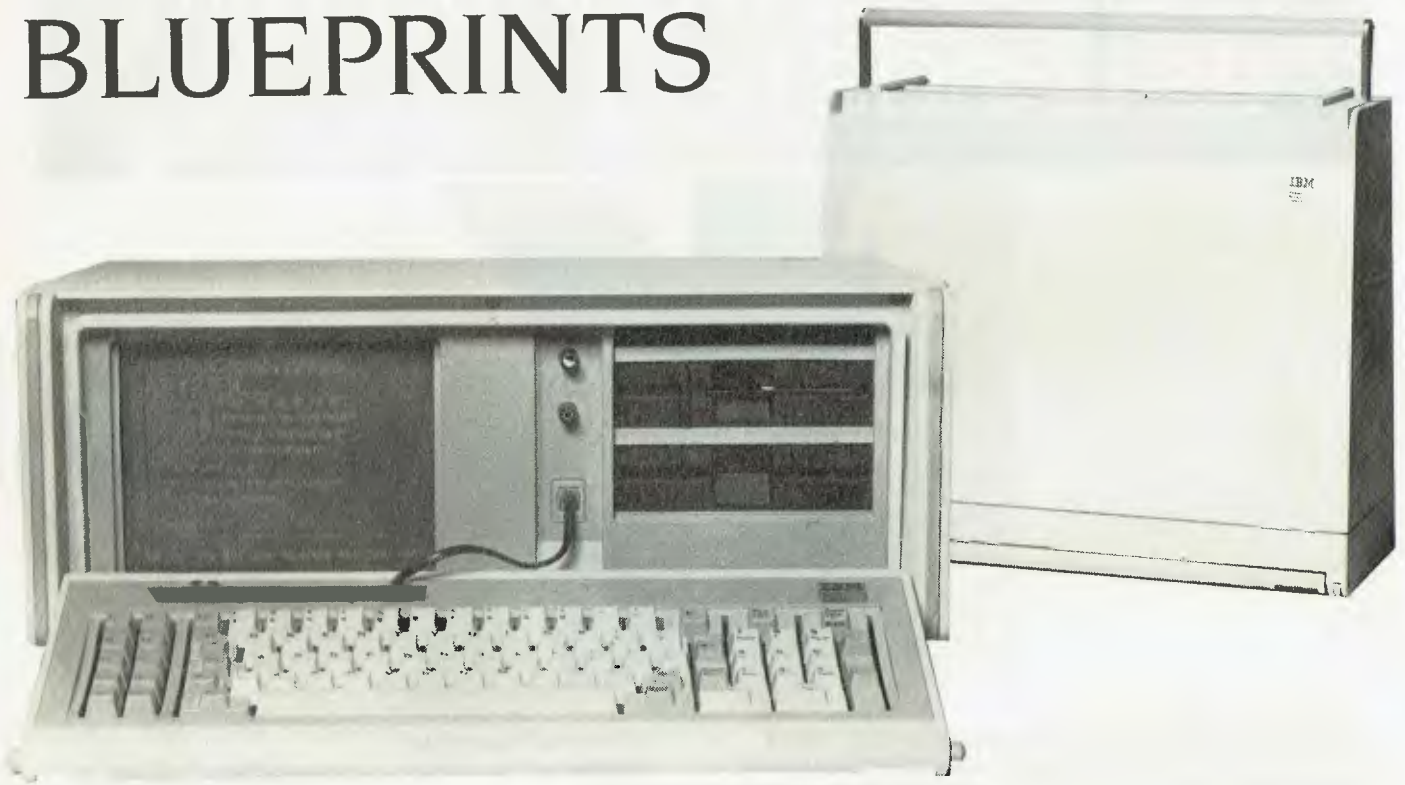


In the past couple of years IBM *has forged ahead to lead the personal computer market as well as maintain its traditional position in mainframes. It's therefore become important at all levels of the market to be able to predict what* IBM *is planning to do next — Les Bell sums up* IBM's *strategies as he sees them.*

A major concern of both users and marketers of mainframe and mini products, and which interests PC users also, is IBM's strategic direction in various market segments. You can be happily minding your own business, planning to use Brand X minis for the next four years or so, when suddenly IBM will show up with a new product which forces Brand X to change direction altogether, withdrawing support from the product line you'd selected. Faced with the probability that many of the developments you'd been promised were coming 'real soon now' actually will never arrive or arrive much later, what do you do? Persevere with Brand X or join the rush to IBM?

It is for this reason, among others, that IBM-watching is such a massive industry. Particularly in the US, there are scores of research companies, newsletters and consultants whose entire *raison d'etre* is trying to second-guess IBM. Even the press here indulges in it, trying to predict release dates for the PC jr and AT.

Never one to resist a challenge, I thought I'd indulge in a little IBM-watching myself, not so much trying to guess introduction dates, but trying to examine IBM's overall strategies in different markets. Every now and again it's a good idea to step back and examine the overall trends, and while one may not always be able to forecast Big Blue's future behaviour, at least the exercise gives a clearer indication of what's happening in the marketplace.

PC Market

Let's start with IBM's personal computer strategy. Why did IBM get into the personal computer market in the first place? The simple answer is that the PC market was growing so fast IBM *had* to act in 1981 — it was then or never. The PC market is close to outstripping the mainframe market in dollar values, and that, quite simply, is why IBM is in there.

A second reason is that the personal computer technology, of simple keyboard/display units based on microprocessors, is easily expanded into the personal workstation concept, and further adapted into a fully distributed set-up with the operating system distributed across a network of workstations, minicomputers and mainframes. IBM has to be a player in that market to control it, and had to gain experience with the PC technology. But this was very much a secondary consideration when the PC was first launched, although it continually increases in importance.

A third reason which has been espoused by some IBM-watchers is that IBM could not tolerate the appearance of non-IBM PCs in its major customer installations. The theory is that IBM's best sales person — the customer's DP manager — was being undermined by executives in the organisation buying Apple or similar PCs. "Why should we authorise further expenditure on a mainframe when we can do nearly as much with a few Apples?", they were reportedly saying, to which IBM is supposed to have responded by launching its PC as part of a large network which will always require more mainframe power at the middle. Frankly, I can't buy this theory completely, although there are some grains of truth at the core.

Having launched the PC, IBM achieved massive market share virtually from day one, to the extent that now it is virtually impossible to obtain software for anything else unless you know where to look. With the XT, IBM further consolidated its position. In marketing parlance, the PC and XT are cash cows, now being milked for all they are worth.

The Portable PC, in marketing terminology, is a dog, largely due to the presence in the US market of Compaq, which has successfully held the high ground of the portable market. Only around one portable IBM is sold to every ten PCs and XTs.

In the attempt to merge the PC and workstation, IBM has announced two machines which will interest mainframe sites.

The 'question mark' of the IBM stable is the PC jr, which initially looked like becoming a dog; but IBM poured resources into fixing the machine's problems and now it is selling much better — virtually on a par with Apple's Macintosh. However, production has been stopped, and it looks very much as though the jr has been withdrawn from the market.

Both the Portable and the jr are an attempt to provide a means for office workers to take work home with them. IBM's survey data indicated that a high proportion of PCs was being taken home from work at least once a week; the question was, was it for business or game-playing, and would people prefer to take a portable machine home from the office, or buy a low-cost machine for the home?

The indications till recently were that IBM would support both approaches. The PC jr has been heavily supported with software and add-ons, and is being aggressively discounted — but whether that's to buy a share in the home market or simply to get rid of final stock is still in question. The Portable also may not be a long-term solution; IBM is expected to release a true 'lap' portable, rather than a luggable one, later in the year.

Merging with Mainframes

In the attempt to merge the PC and workstation, IBM has announced two machines which will interest mainframe sites. The 3270 PC is a regular PC with additional 3270 communications board, higher-resolution display and a considerably enhanced keyboard. Special operating system software allows the 3270 PC to display up to seven windows on its screen — four 3270 mainframe sessions, two scratchpads and one local personal computing (DOS) window.

Two other versions of the 3270 PC, the PC/G and the PC/GX, have extra-resolution graphics cards with up to 960 by 1000 pixels in 16 colours for CAD/CAM applications.

The other major enhancement to the standard PC is the XT/370, which adds 3270 capability, additional memory and a special processor card. This card carries three microprocessors which between them emulate virtually the entire IBM/370 instruction set. This allows software development and testing under the XT/370's VM/PC operating system, and subsequent uploading of object code to the production mainframe.

However, the major machine in IBM's product line currently is the AT. This micro, which was released in the United States in September last year and is not yet available in Australia, boasts a significantly faster microprocessor, more memory, more disk space and all-round higher performance.

The AT has cannibalised the PC and XT market shares since its introduction, and it is now obvious, particularly when pricing in the United States is examined, that there is considerable overlap in IBM's PC product range. This strongly supports some observers' belief that IBM will soon release a new-model PC to occupy the middle range.

Locking out Compatibles

IBM's future PC strategy is basically intended to lock out the compatibles. This will be achieved through several means — firstly, use of proprietary operating systems and operating system extensions. While IBM will use DOS 4.0, that will be the last Microsoft operating system it will ▷

use, and subsequent operating systems will be proprietary IBM products.

One can already see some signs of this in TopView, IBM's proprietary windowing/multi-tasking environment for DOS. While TopView will operate on IBM-compatible PCs, the fact is very few compatible manufacturers will be happy to see the IBM logo appearing on the screens of their machines. The next generation of operating systems will extend this trend further by exploiting hardware-specific features to an even greater extent.

Bear in mind TopView is not written to run solely on the PC, but is also intended to run on mainframes and minis on terminals such as the 3278 and 3279.

Although these IBM-written operating systems will offer new facilities, they will remain compatible with earlier PC DOS software. The intention here is to create an operating system which is to at least some extent compatible with that on IBM's larger machines. Remember IBM's strategy is to tie PCs into networks with large minis and mainframes in the middle, and the obvious intention is that when a PC user enters terminal mode to use the central mainframe he or she should encounter an environment which is at least similar to that on the PC.

Various operating systems suggest themselves as candidates, varying from Unix and its derivatives (versions of which run on the XT and AT) to IBM's mainframe operating systems. In this latter category, the major contender is VM/CMS (conversational monitor system), a version of which is already running on the XT/370. IBM introduced this some years ago and then tried to withdraw support for it, but was forced to reinstate support due to user demands. IBM is responsive to customer requests.

Networks

IBM is a slow starter in the PC networks business, but it has years of experience in large networks, particularly those based on SNA (systems network architecture). SNA is a large system, designed to accommodate a wide variety of network applications ranging from high-speed peer-to-peer data transfers to low-speed terminal communications between remote offices and central mainframes using low-speed leased telephone lines.

It's an interesting statistic that Australia uses more SNA (per head of population) than any other country in the world.

However, SNA is simply too complex a protocol, and too high-performance, to be supported on current generation PCs. IBM is addressing this in several ways.

Now under development is what the rest of the world calls IBMNet and IBM currently calls the IBM Cabling System. The network will not be available for another two years or so, but the cabling components are available now. This is because large users will need that amount of time to install the cabling.

It's an interesting statistic that Australia uses more SNA (per head of population) than any other country in the world.

The purpose of the Cabling System is to replace the vast amount of point-to-point cable currently required to connect terminals and cluster controllers to mainframes. Unfortunately, experience at the first few sites indicates the Cabling System does not do much to help, since its star configuration means cables must be run from each device to a wiring closet. This is counter to conventional LAN wisdom, which runs from device to device, saving wire and getting better use from already crowded cable ducts.

Since IBMNet has not yet been released, it is difficult to see what application area it addresses, and there will not be many installations of the Cabling System until its network software is released. However, the majority of sites which have installed it to date appear to be traditional DP installations with a large number of 3270 terminals, rather than more general office automation installations.

Further down the market (in dollar terms) is the IBM Personal Computer Network. This more closely resembles the traditional (if such a word has meaning here) local area network, consisting of a broadband bus system which interconnects small clusters of PCs to each other via a network interface unit.

Right at the bottom of the market is the PC Cluster Program, a low-cost network which seems to have been introduced as a stop-gap measure while everyone waits for the PC Network. Technically flawed, Cluster Program was made available in Australia but never actually announced. It suffers from obscure problems like not allowing the user to switch disks once the network is up and running.

Off to one side is the IBM factory network, which is intended for industrial and robotics applications.

So Where's It All Leading?

At least for the foreseeable future, SNA must remain the top-line network product for large networks of mainframes. Too much software has been written for it and too much expertise developed to abandon it, and the Cabling System does not do the same job. For PCs, the answer is easy: the PC Network will be the default network for those who want to maintain compatibility with IBM's larger systems. Even if you're not concerned about this, the PC Network is a reliable and high-performance way of linking PCs.

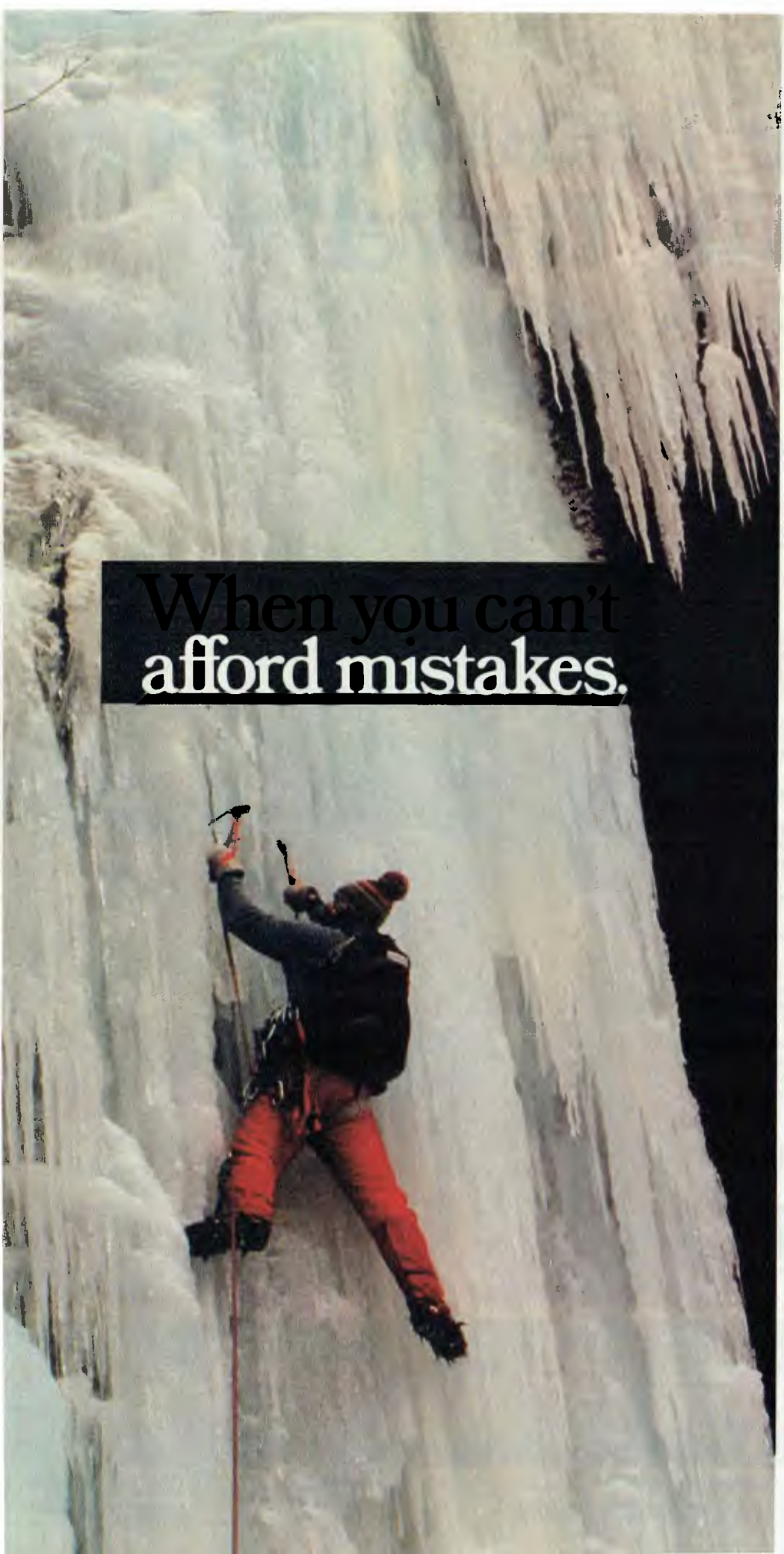
The Cabling System or IBMNet appears to be a backbone network which will link mainframes to smaller devices such as terminals and PCs; however, it is likely that PC connection will be via a gateway which links a PC network to IBMNet.

Office Automation

IBM was an early player in the office automation market with the Office System 6 and the 6670, an early laser printer. Even earlier, of course, there was the golfball typewriter and magnetic card typewriters and the DisplayWriter word processor.

Despite a wide variety of products in the office automation market, IBM has not been able to achieve any major part of this market, having to share it with minicomputer vendors like DEC and Data General as well as dedicated word processor manufacturers and PC companies.

Obviously, the IBM PC must play a major part in IBM's plans in this area. However, the lynchpin of the strategy here is the System/36, a minicomputer with an enviable track record. While the early ▷



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IBM deals with both ends of the microcomputing spectrum, plus a good deal in between. Left is the System/36 supermicro range, while below is the PC junior, which has a large question-mark over its future at present. Simulated space photo by Horizon/Steve McHugh.

models of the 36 had a minicomputer price tag, the new models are based on microprocessor technology and are priced very competitively.

The System/36 is produced by IBM's Rochester division, which has traditionally been responsible for IBM's smaller systems. When IBM management mooted the PC project, Rochester division was somewhat surprised that the job went to Boca Raton, and there is a theory that Rochester division still believes it could build a better PC than Entry Systems Division and intends to win the opportunity. Late-model 36s are priced not far above the PC, at around $US13,000.

Office applications recently released on the 36 include DisplayWrite/36, which is based on the PC's DisplayWrite program; Personal Services/36, which provides mail handling, calendar management and telephone directory support; Query/36, which is a report generator; and an updated operating system which provides integration of these programs.

A System/36 thus makes a nice machine to support a work group — say four to seven people — while greater numbers can be handled by networking the systems. However, for larger customers, who may already have IBM mainframes in traditional transaction-oriented DP applications, IBM has worked out a further strategy. This is called DISOSS, the Distributed Office Support System, which

This computer system won't give you any arguments at home.

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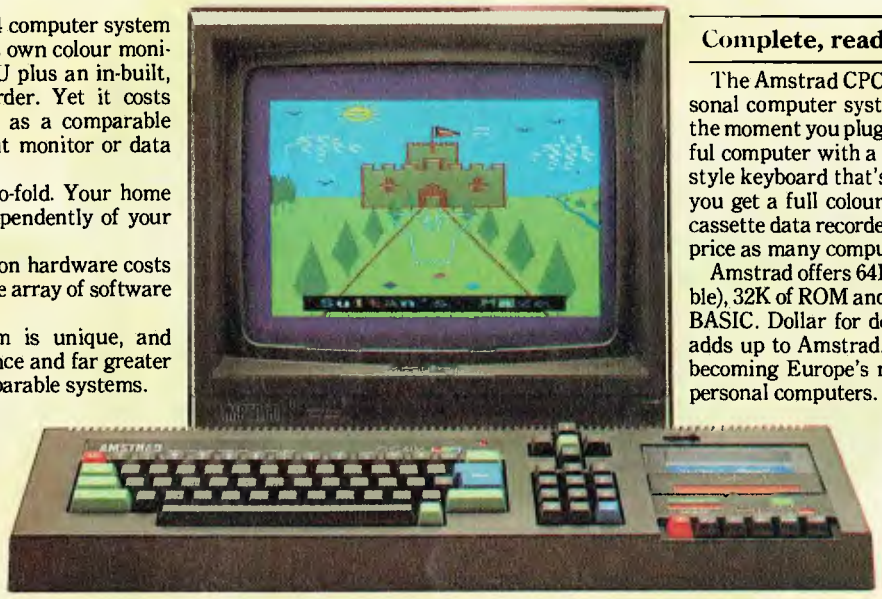

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The Amstrad CPC464 is a complete personal computer system that's ready to go the moment you plug it in. You get a powerful computer with a full colour typewriter style keyboard that's a breeze to use. Plus you get a full colour monitor and in-built cassette data recorder for around the same price as many computer keyboards.

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TPB/328

supports a number of applications. A key application is PROFS, a document management system which supports spelling checking, grammar and style checking and other refinements.

System/36s can be networked to a 370 series machine running DISOSS, and in particular can send and receive documents using DIA (document interchange architecture) and DCA (document content architecture).

Mainframe Strategies

Perhaps the major challenge IBM faces in coming years is the proliferation of operating systems and utility software for its mainframes. Mainframe hardware technology is relatively simple to manage compared with the software problems.

The number of operating systems available for IBM mainframes is staggering, particularly counting the various combinations and permutations through OS, DOS, VM, VSE, XA and so on — and you have to add to that the various teleprocessing monitors, access control systems, network managers and so on.

The problem is, when writing a program, the programmer needs to know in what sort of environment it will be running. Since this changes from site to site, software development can take much longer and cost more than if a standard environment existed. Nowhere can this problem be more evident than within IBM itself.

A major goal therefore has to be the standardisation of operating systems to permit greater portability of software and reduced costs. This, of course, also relates to the provision of a standard environment mentioned above in connection with networks of personal computers. A mainframe that sits at the heart of a network of PCs and other distributed systems will look somewhat different from what we are used to.

Just which way IBM will jump is virtually impossible to predict; even professional IBM-watchers are right only around 40 per cent of the time. However, IBM has to respond to the same technical challenges as the rest of the industry. It can no longer simply force developments; the rise of the minicomputer and especially the personal computer has put paid to those days. □

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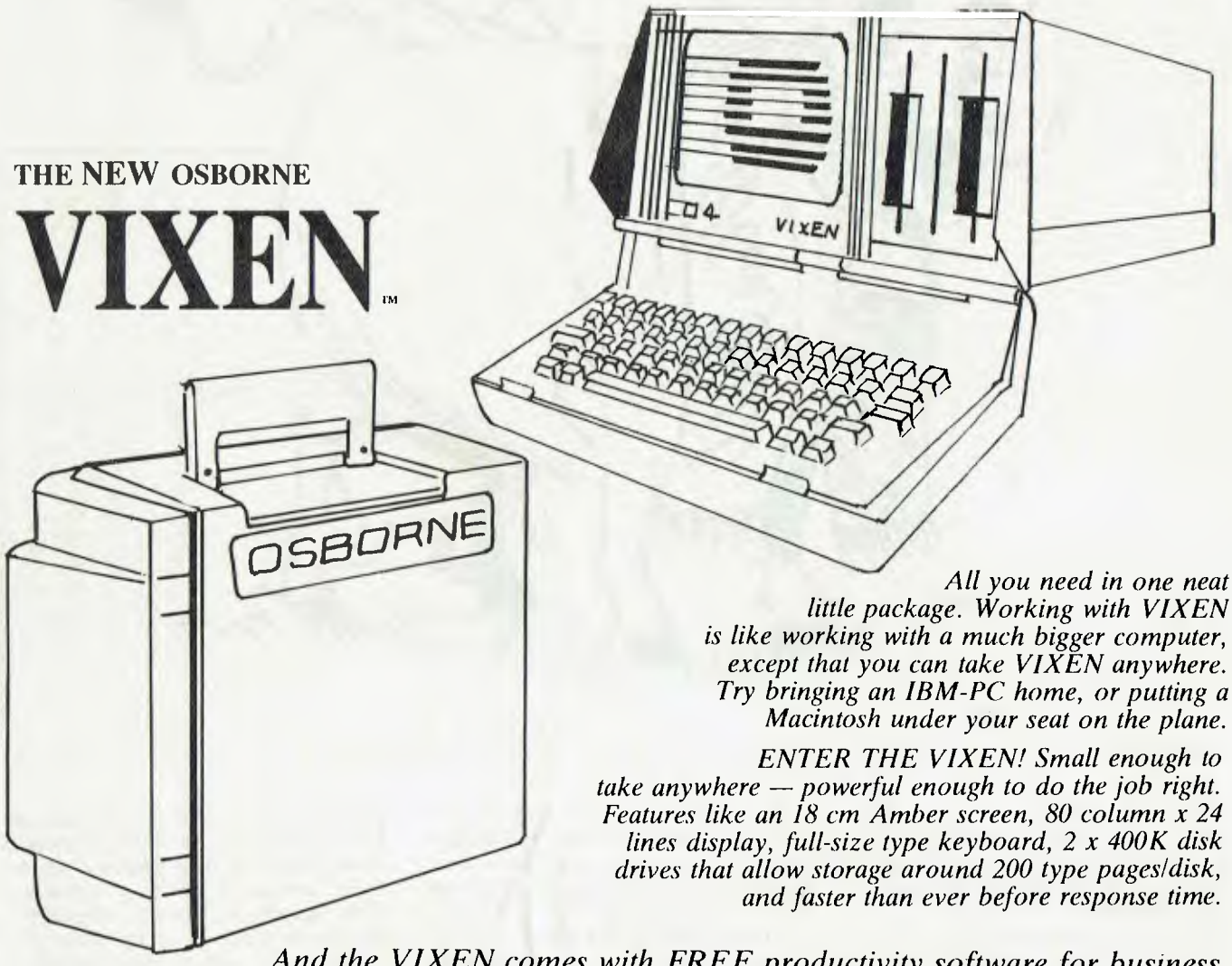

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TRUE BLUE
IBM's Australian Software Development Centre

Since 1983, IBM has been actively involved in development of Australian software. Here, Norman Kemp looks at the kinds of projects the company's Software Development Support Centre, based at its Wangaratta plant, has been fostering.

The voice of experience suggests young and hopeful Australian software designers looking for home or overseas markets in which to launch exciting new personal computer products should take them to IBM Australia first.

That's not an IBM commercial. It's a quote taken from a recent interview with Gary Blom, a highly successful young Australian promoter who has launched Attache accounting software on more than a dozen brands of personal computers, and rounded up nearly $12 million in venture capital in the US to found Attache Software International at Ann Arbor, Michigan — a far step from Attache's first office in North Sydney. With IBM support, Attache's PC/AT version is now being sold in Canada, the United States, Singapore and Hong Kong, and new markets and other products are being explored.

Australian software writers need marketing skills and finance to break into overseas territories, says Blom. Even then, they also need luck on their side, for tales of failure are far more common than those of success.

Attache, says Blom, was fortunate in its timing. A product devised for chartered and public accountants, it was looking for a personal computer vendor at just the same time IBM Australia had set up a software development division which was on the scout for Australian talent to write for its PC and XT.

Attache, a company formed by Gary Blom, Geoff O'Reilly (of O'Reilly Computer) and John Portus (of EDP Admin Services), all well-known in the Sydney software world, had developed the Attache accounting package from an O'Reilly system for IBM PCs, known as MicroTiger. Originally intended for small businesses, the program had been enlarged and enhanced to consist of seven programs, written in compiled BASIC, which can be purchased separately or in functional modules.

"IBM's decision to acquire the Attache series of accounting systems was made after months of rigorous technical assessment," said Dr Frank Barr-David, director of IBM Australia's Software Development Support Centre (SDSC), when the deal was announced in February 1984. He added, "This is another first for IBM Australia, as until now IBM has not marketed in Australia any product which did not carry its own logo."

The formation of the IBM Software Development Support Centre and the appointment of Dr Frank Barr-David, a senior executive and a director of the company, to head it was announced by IBM Australia's managing director, Brian Finn, in October 1983 at the official opening of the IBM PC and XT manufacturing facility at Wangaratta, Victoria (PC/ATs destined for Australian and Asian markets will probably also begin manufacturing here late this year).

The Wangaratta plant, SDSC and some other facilities are part of IBM Australia's contribution to federal and state government offset plans. These require overseas ▷

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companies tendering their products in Australia to add — or offset — some of the value in local manufacture, improved training for Australian workers or development of domestic skills and introduction of new technology for the benefit of this country.

"Australia has literally hundreds of software companies providing a large range of world-standard software," Brian Finn said. "Software production represents around 20 to 40 per cent of a typical personal computer sale, and IBM can achieve a high level of local content by sub-contracting production in Australia."

Encouraging Hi-Tech

In general, IBM's plans for the SDSC fall in line with recent government encouragement of selected high-technology industries. The SDSC has been established to encourage professional software companies to produce software products which IBM will market internationally.

The SDSC's mission is not concerned only with personal computer software. Its first contract, said to be worth about $2 million, was with Datec of Sydney and called for complex extensions to internal programming which ran under IBM's MVS operating system for large computers. This work was commissioned both for the local IBM company and its overseas affiliates in business systems.

The Software Development Support Centre has also acquired a library management system for System/36 computers, from Stowe-BBA of Adelaide. This package was based on a 'Book' program developed previously by Stowe-BBA. Commenting on the acquisition, Dr Barr-David said IBM saw significant potential for small systems in public, private and specialised libraries. IBM Book modules comprise circulation control, subject search and cataloguing, with provision for such other collections as cassettes, periodicals and prints.

Also in the larger system arena, the SDSC has an agreement with Wilkinson Computer Services of Melbourne to jointly market a Telecom-approved IBM telex management system known as Wiltel. This system comprises three programs which interface the IBM System/34, System/36 or System/38 to the public telex network through a protocol converter. It also features a clock which reports the time in more than 100 cities, and the date on which each city changes to and from daylight saving. Each Wiltel program is actually two in one — a message handler which automates most aspects of telex preparation and transmission, and a data communications facility which enables standard telex devices to be used as dial-up terminals to an IBM host computer.

The two latest acquisition agreements have been with Aid Systems and Blue Sky Industries, of Sydney, for versions of a self-teaching typing program, Typequick, for the IBM PC, and a technical product, Moldflow, for plastic process plants.

Under the terms of the Typequick agreements, IBM has non-exclusive marketing rights and is distributing the package as a 'vendor logo' product — that is, retaining the Typequick generic name. Typequick is a microprocessor-based keyboard training course for business, education and home users. It has been in production for a couple of years and is already used in a number of corporations and educational institutions. Dr Barr-David said IBM's interest derived from the increasing requirements in the working community for keyboard skills.

Moldflow is in an entirely different category, intended for product designers, toolmakers and injection moulders in the plastics industry. Designed and developed by a Melbourne company, Moldflow, it allows the user to look inside a model of a part on a computer, to see how much material is needed to fill a cavity. Dr Barr-David said the software had been application tested at IBM's manufacturing plant at Boulder, Colorado. "The software has been developed jointly by IBM and Moldflow to run under MVS, the operating system used on IBM's large mainframe processors," he said. It uses the IBM 3250 graphics display and IBM 5080 high-performance colour graphics system designed for computer-aided design (CAD), computer-aided manufacturing (CAM) and data applications.

By the end of last year, IBM Australia had more than 30 new software products being tested and under consideration. Many will have to be further developed, some may never be heard of again, but going by the current record of achievement of the SDSC it is likely Australia's talented software writers will continue to produce, and be able to present to the world, an increasing number of valuable applications packages and programs for operating systems of the highest international technological standard. □

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Dimensions:	11"(H) x 15"(W) x 13"(D) 266(H) x 367(W) x 318(D)mm
Shipping Weight:	15.9kg

Models HR 39 & HR 134

Technical Data - HR 39 & HR 134

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V. Scan Frequency:	50/60Hz
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Video Response:	20MHz
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THE BLUE BOXES
IBM's Systems Explained

Big Blue builds blue boxes, too, you know — not just little grey PCs. Les Bell looks at the model lineup of the world's biggest (bluest?) computer company.

The introduction of the PC in 1981 made IBM much more visible to the man in the street — suddenly, the world's largest computer company was selling the world's smallest computer.

At least, that's the way it seemed, if only because the PC is so small compared to the machines IBM is known for. And the PC is only a small part of IBM's business. Even if you are simply a PC user with no conceivable interest in larger machines, it's worth bearing in mind that the way IBM wants to market bigger systems (the iron, we call it) will also affect the way it markets the PC, and what future products in the PC family will look like. You may not know, for example, that within IBM the PC is not known as the PC; it's also called the IWS, for Intelligent Work Station.

IBM's products range from small business systems just a bit larger than the PC, through minicomputers to mainframes with power almost beyond the comprehension of the average PC user (although it's also fair to say the power of the PC is beyond the comprehension of many mainframers!).

System 9000

It's not all that widely known outside scientific circles, but IBM does have a supermicro in the family. The System 9000 is a Motorola 68000-based micro from IBM Instruments Division which is strongly orientated towards laboratory data acquisition and analysis. The S9000's ace card is interfacing; it has not only the usual RS-232C and parallel ports but also an IEEE-488 port for communicating with intelligent instruments.

Two operating systems are available for the S9000; CSOS is a real-time multitasking operating system optimised for data acquisition and processing, while Xenix is a version of the Unix operating system which lacks real-time facilities.

Two versions of the machine itself are available. The 9001 benchtop computer consists of the computer, display, integrated colour printer/plotter, PC-type keyboard and a 57-key membrane keypad. The 9002 is basically just the computer itself for non-scientific applications. Memory capacity is 128 Kbytes of ROM and 128 Kbytes of RAM as standard, expandable to over 5 Mbytes.

The 9000 is interesting in that it shows (as does the System/36) alternative sources of personal computing expertise and technology within IBM. It is this that makes trying to second-guess IBM such a fruitless exercise; you can never rule out the possibility that IBM might release a 68000-based PC at any time.

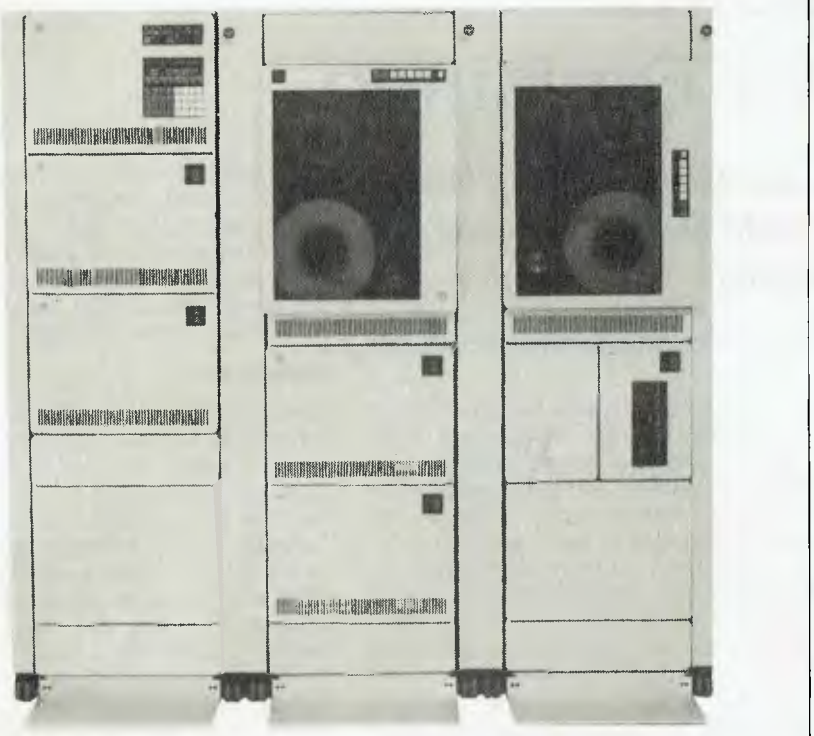
System/36

The System/36 is a small minicomputer for small to medium-sized businesses. Its smallest model, the 5362, is comparable in power and technology to supermicros like the CompuPros used here at *Your Computer*, and the pricing is not very different, either: on the home market, the 5362 sells for just over $US13,000.

In fact, the way IBM views the System/36 is rather like a supermicro. Configurations can start from a single-user system with one display terminal and printer, to systems with up to 64 remote terminals and printers. While the 5362 can support up to 22 devices, the larger 5360 CPU can go much further.

PC users will find the 5291 terminal, the ▷

Computer power! The computing centre at IBM Australia's new Cumberland Forest (Sydney) headquarters has $80 million worth of hardware — including 80 gigabytes.



Series/1

most common on the /36, looks rather familiar — particularly the keyboard, which is identical to that on the PC, although with different legends.

Software support for the /36 is varied, but strongly orientated to the non-technical business user. The System Support Program is menu driven, allowing the inexperienced user to perform system tasks such as initialising diskettes and copying files.

Languages available on the System/36 include RPG II, one of the most common business programming languages, COBOL, BASIC, FORTRAN IV and Assembler. Applications software includes business graphics support and specialised packages for the distribution, construction, and manufacturing industries as well as libraries and legal offices.

The System/36 supports a wide range of peripherals, including a range of printers and terminals. Also available are plotters, tape drives, magnetic card readers and a diskette magazine drive which can access up to 23 floppy disks without operator intervention. Also important is the ability of the System/36 to work with specialised terminals for the banking, retail and other specialised industries.

Series/1

Also in the minicomputer area is the Series/1, a general purpose mini for technical applications. IBM seems to treat the Series/1 as a general-purpose building block for all the oddball applications which don't quite fit other machines.

For example, it could be found acting as a front end processor to a larger IBM mainframe computer, controlling multiple terminals and communications networks while allowing the mainframe to do what it does best — processing. On the other hand, Series/1s are used at IBM's new Cumberland Forest head office to control sun screens, monitor the air conditioning, turn lights on and off and control the irrigation system in the grounds.

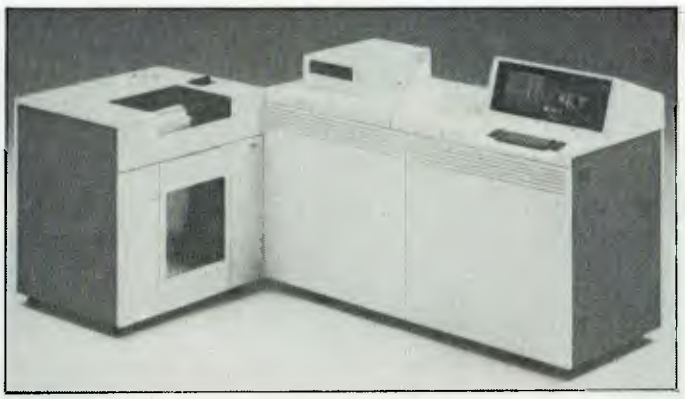
The Series/1 is particularly strong in real-time multi-tasking applications and communications. For example, one of the two operating systems for the machine, EDX (Event Driven Executive) supports a macro assembler language called Event Driven Language which is particularly powerful for these applications.

System/38

The System/38, as you might expect, is a big brother to the System/36, although the accent is on office automation applications.

Two basic models of this machine are available, the 5381 and 5382, the largest of which supports up to 16 Mbytes of main memory. Up to 128 terminals and printers can be attached to the system.

The major applications software package for the System/38 is Office/38, which includes document management functions (word processing, filing, proofreading support), appointment calendar, business graphics utility; Worksheet/38, a quite decent spreadsheet program; and



System/38

Series/1

Applications Made Easy, a simple menu-driven fourth generation language and database manager.

Languages supported on the System/38 include RPG III, COBOL, BASIC and PL/1, while programmers' utilities support source code entry and syntax checking, data file maintenance, screen design and database query.

The System/38 is also a good communicator, supporting everything from file transfer to/from PCs to communications between programs on the /38 and on a mainframe host.

The 8100 Information System

The 8100 Information System is a minicomputer line primarily intended for distributed data processing and office automation applications. The accent here is on providing a system which does not require support by a data processing professional. The 8100 operating system DPPX (Distributed Processing Programming Executive) is simpler to install than most mini and mainframe operating systems, and can be reconfigured by end users.

Several models of processor are available, with memory capacity from 1 to 6 Mbytes and with single or dual processors, and peripherals include disk storage, mag tape unit, terminals and printers.

The 8100 supports a variety of software, but perhaps the key packages are IDTF (Interactive Display Text Facility), which gives word processing capabilities to data processing terminals, and DOSF, the Distributed Office Support Facility. IDTF supports most word processing functions one is likely to require, while DOSF adds document management, storage and retrieval functions, together with calculation facilities within word processing.

The 4300 Series

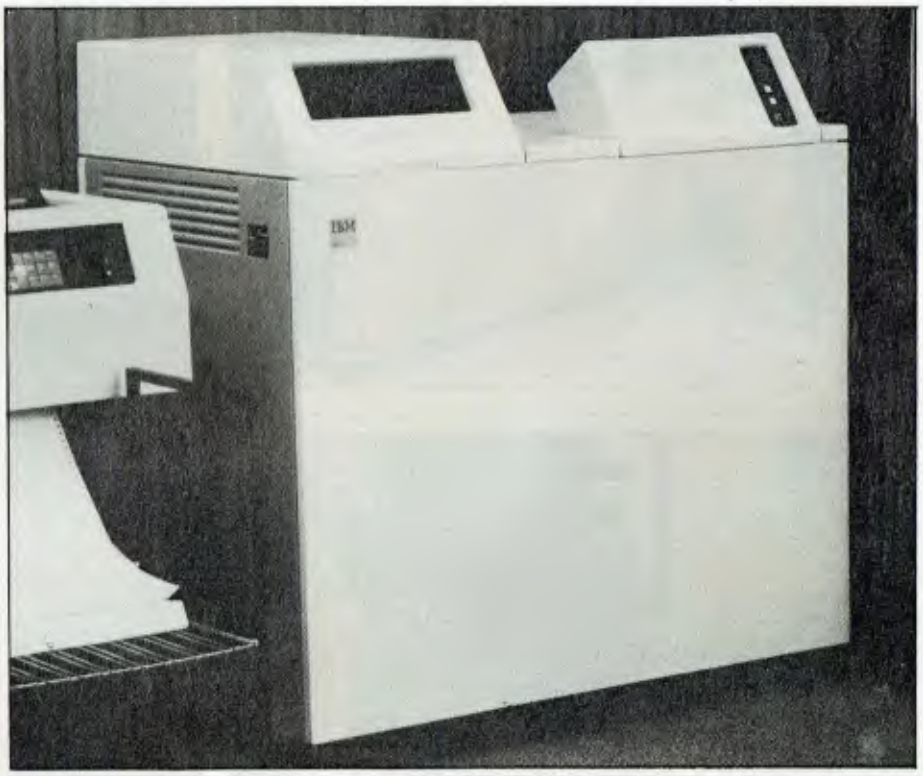
It's hard to categorise the 4300 family; are they small mainframes or large minis? IBM itself resolves the question: 'the IBM 4361 is a true supermini: a compact, high-performance processor with integrated I/O attachments.'

Designed at IBM's Boeblingen Laboratory on the edge of the Black Forest, the 4361 capitalises on the standard System/370 architecture, the same as the larger IBM mainframes. Based on the latest VLSI technology, the 4361 offers high performance with none of the attendant paraphernalia we have come to associate with machines of this capability: special high-capacity air conditioning, false flooring with cable ducts and so on.

IBM uses its own proprietary 64K chips in the 4361; four of the chips are placed on a ceramic substrate and then eighteen of these packages are placed on a 70 mm by 125 mm (3 inch by 5 inch) memory board with a capacity of one megabyte. Up to 12 such boards can be installed in the mainframe, for a total memory capacity of 12 Mbytes.

Operating systems for the 4361 are SSX (Small System Executive), VSE (Virtual ▷

System/38



System/36

Storage Extended), VS1 (Virtual Storage 1) and VM (Virtual Machine). With the addition of external control units, the machine can also run MVS. A wide range of commercial and engineering/scientific software is supported, ranging from the IMS database system through to engineering graphics libraries.

System/370 Series

In 1964 IBM introduced a new line of computers. Earlier models such as the 7090 had had a different architecture with each new model, requiring rewriting of operating systems, compilers and applications software. The System/360 changed all this. For the first time, a range of computers all ran the same software, and this key advance ensured IBM's dominance in the mainframe market.

With subsequent changes in hardware technology, a new range was introduced, called the System/370. This consolidated IBM's position further. The System/370 architecture was a superset of the 360 family, ensuring that software could be moved between the systems, and perhaps even more importantly, that staff did not have to be retrained.

The concept of upward compatibility is crucial to the mainframe architecture. There are so many thousands of man-years of software development invested in the 370 architecture that to scrap it would be economically costly at best, risky for sure and potentially disastrous.

There are still quite a few 370s in operation. They are a large and powerful machine — take the 370/158 for example, a machine from near the top of the range. Its processor is capable of 20 million instructions per second, which is approximately 100 times greater than a present generation PC. It has a total I/O bandwidth of 20 Megabytes per second, over twenty times greater than the PC.

The /370 series was retired a few years ago and replaced by the 303X family which provides similar facilities in a smaller package and at a lower price. Most recently, we have seen extensions to the 370 architecture in the form of Extended Architecture (XA), which increases maximum memory from 16 Mbytes to 2 Gigabytes (2,000,000,000 bytes!). This requires new versions of the operating system software, but has relieved a major bottleneck for big customers.

IBM's latest mainframe announcement is the 3090, a machine which starts with 64 Mbytes of memory and has a dyadic (dual) processor with a performance around 20 MIPS (million instructions per second). This family of machines will take IBM's mainstream architecture up to the supercomputer level of 100 MIPS. Prices (for those with money to spare) start at around $7 million.

IBM's product range covers every size of computer from desktop personal computers through to supercomputers. And we still haven't covered some of the special-purpose machines, like the Advanced System/4 Pi Model AP-101 computers designed for the Space Shuttle, or the Displaywriter, an 8086-based word processor with some data processing and networking capabilities. Maybe next time . . □

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There are many C compilers now available for the Z80 and 8086 (or 8088) processors; the quality ranges from terrible to quite good, and not all are available for both processors. Now there is a wholly Australian-developed compiler which outperforms all the others in all areas. HI-TECH C produces smaller, faster code than any other compiler for these processors, has a better user interface and provides features which are optional extras with the others. Furthermore, HI-TECH C delivers what we promise; although there is no such thing as bug-free software, we do not release unreliable products.

This is a solid production-quality compiler now being used by government departments, major Australian companies and many small companies and individuals. It is available for the Z80 and 8086/8088 processors, running under CP/M-80, CP/M-86 and MS-DOS (or PC-DOS).

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Z80 BENCHMARK (2Mhz Z80)

Program: Primes (Eratosthene's sieve)

Compiler	Execution Time	Compilation Time	Program Size
HI-TECH C	40	100	4153
Whitesmiths	60	420	15745
C/80	63	140	3584
Aztec	78	144	9168

8086 BENCHMARK (IBM PC under MS-DOS)

Program: Eight Queens

Compiler	Execution Time	Compilation Time	Program Size
HI-TECH C	14	105	4500
Lattice C	17	111	14000

Also available: 8085 and 6809 cross-assemblers

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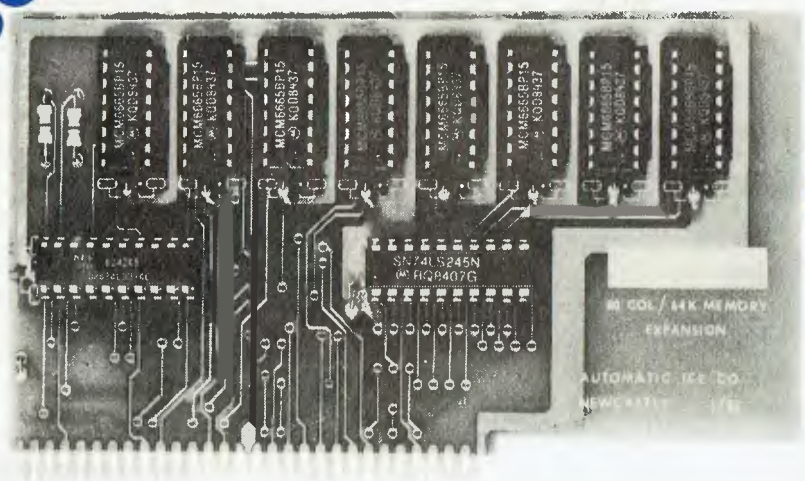

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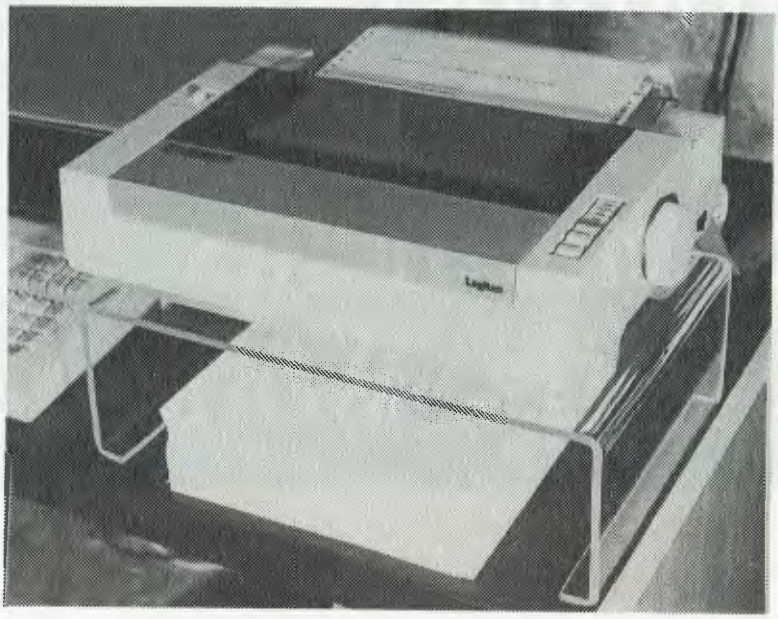

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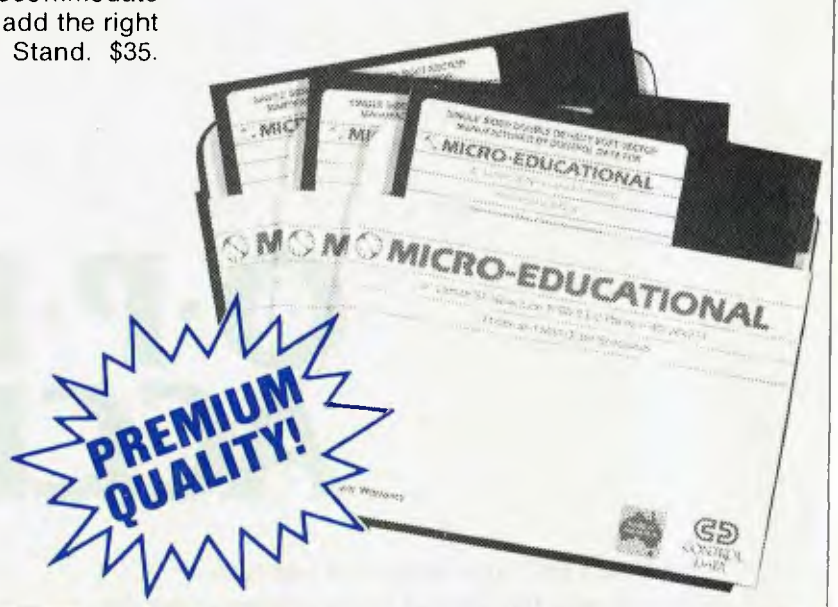

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Word Processing

Microsoft Word Version 2
Distributor: Microsoft
Price: $550 (With mouse — $715)
Features: A mouse-driven word processing package with mail-merging and on-line help facilities.
Requirements: MS-DOS or PC-DOS, IBM-PC or compatible, 128 Kbytes RAM, and one disk drive (160 Kbytes).

New Word
Distributor: Archive Computers
Price: $395.
Features: Similar to WordStar, but with enhancements for single- and multi-user microcomputer systems.
Requirements: MS-DOS, PC-DOS, MP/M, CP/M or CP/M-86 operating systems.

Wordcraft
Distributor: Personal Computer Services
Price: $750
Features: This word processing system has full communications facilities, allows deletion of characters, words, lines, sentences or blocks of text, with the ability to 'undo' deletions, and a built-in spelling checker.
Requirements: MS-DOS or PC-DOS, 128 Kbytes or more of RAM.

Superspellguard
Distributor: Arcom Pacific
Price: $80
Features: Superspellguard has a built-in spelling checker that flags any mismatches it finds when it compares your document to the 20,000 words in its dictionary file. It can proof 40 pages a minute and also provides a word count of the document.
Requirements: CP/M-86 or PC-DOS.

Samna Word III
Samna +
Distributor: Arcom Pacific
Price: $795, $995
Features: The Samna range of word processing packages from Samna Corporation is modelled on dedicated word processors. It offers advanced features for page layouts and design, automatic pagination, footnoting and glossary facilities. Samna+ integrates a spreadsheet into the word processor. Any changes made in the spreadsheet are automatically updated in the accompanying text.
Requirements: PC-DOS.

WordStar Professional
Distributor: Imagineering
Price: $595
Features: WordStar Professional is a group of support products for WordStar, including MailMerge, SpellStar and StarIndex.
Requirements: PC-DOS and WordStar

Perfect Writer
Distributor: Perfect Information
Price: $345
Features: Perfect Writer is a full-featured package with help screens available while editing. It also has an on-line thesaurus and sophisticatd document design and printing capabilities.
Requirements: IBM PC, XT or compatible.

PFS Write
Distributor: Imagineering
Price: $195
Features: PFS Write can produce documents with boldface, underlining, page headings and footnoting, and allows automatic page numbering. It can work in conjunction with other packages from the PFS range, as well as with programs such as Lotus 1-2-3 and Visicalc.
Requirements: An IBM PC.

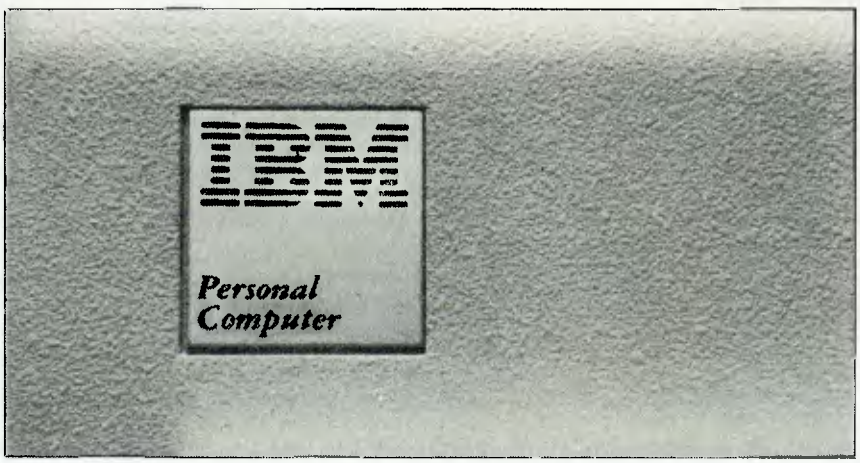
MailMerge
Distributor: Imagineering
Price: $120
Features: MailMerge works with the WordStar word processing package. A versatile file merging program, it can produce personalised form letters, and assemble and print mailing labels.
Requirements: WordStar and CP/M-86 or MS-DOS.

Multimate 3.3
Distributor: SCA Software
Price: $695 (Including British Dictionary)
Features: Multimate performs over one hundred word processing functions, most of which can be executed with one or two keystrokes. A spell-checking function flags any mis-spelled words.
Requirements: PC-DOS or MS-DOS, and 128 Kbytes of RAM.

Xenix Text Processing System
Distributor: Siromath
Price: $2,450 (Complete Xenix System)
Features: A collection of powerful tools for enhancing text or document-writing productivity. A wide variety of specific fonts and printer types are supported, including letter quality, dot matrix line printers and phototypesetters.
Requirements: IBM PC XT.

Wordstar 2000
Wordstar 2000 +
Distributor: Imagineering
Price: $645, $795
Features: The latest in the WordStar family of products. Completely rewritten in C, it takes advantage of the PC's keyboard and offers on-line help, single-keystroke commands, and powerful formatting capabilities. WordStar 2000+ has extra features including telecommunications.
Requirements: An IBM PC or XT.

CorrectStar
Distributor: Imagineering
Price: $150
Features: This add-on spelling checker for WordStar offers a large dictionary, plus the ability to correct spelling based upon phonetic pronunciation rules.
Requirements: DOS.



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SpellStar
Distributor: Imagineering
Price: $120
Features: SpellStar contains 20,000 of the most frequently used words in the English language. It flags mistakes in context for correction, and can add words to the main dictionary or create custom dictionaries.
Requirements:Two floppy disk drives with a minimum of 128 Kbytes per drive, and WordStar

StarIndex
Distributor: Imagineering
Price: $120
Features: StarIndex creates an alphabetical index, table of contents and lists of figures and tables in a document. It numbers paragraphs, sections, appendices and tables, and tracks them as you insert and delete. It allows you to store your own personal format for printing and numbering pages and headings, and can index multi-file documents.

The Word Plus
Distributor: Software Source
Price: $239
Features: The Word Plus is an integrated series of tools designed to carry out spelling correction and other dictionary-based tasks as efficiently as possible. It shows errors in context, aids the user in finding the correct spelling and automatically makes the chosen corrections throughout the document.
Requirements: CP/M-86.

SpellBinder
Distributor: Software Source
Price: $695
Features: A powerful word processor, Spellbinder allows mail-merging, form handling with mathematical calculations within a form, simple cut-and-paste operations and is programmable.

The Final Word
Distributor: Mark of the Unicorn
Price: POA
Features: The Final Word is based on an earlier product called MINCE. Cursor control is similar to that of Spellbinder. The program allows you to edit two files at once, and offers automatic footnoting and indexing and sub-topic enumeration.

Database Management

Dataflex-86
Distributor: Intelligence
Price: $1000 8-bit, $1420 16-bit (single-user), $1420 8-bit, $1880 16-bit (multi-user).
Features: This package allows a complex system to be developed in a data management environment. Its multi-user capabilities can be utilised on suitable hardware or networks. Dataflex-86 has a high-level command language, with a powerful code generator for screen handling, file updating and so on.

Middleton and Rose's Database
Distributor: John F. Rose Computer Systems
Price: $600
Features: Runs eight applications simultaneously and is designed for users who require a customised program. Comprehensive help screens incorporate the manual. Help messages can be edited by the user. John F. Rose Computer Systems will install and customise the package for an additional fee of $500.
Requirements: IBM PC-DOS or MS-DOS.

Display Manager
Distributor: Arcom Pacific
Price: $712 (CP/M-86, MS-DOS); $570 (CP/M-80)
Features: Display Manager from Digital Research is a standalone system that provides developers with an interactive full-screen editor. It allows visual attributes such as blinking, underlining and inverse video, and is compatible with DRI's full range of compilers.
Requirements: CP/M-86 or PC-DOS and 64 Kbytes of RAM.

dBase II
Distributor: Arcom Pacific
Price: $631, Multi-user $1390
Features: A database management tool that allows manipulation of small and medium-sized databases using English-like commands. You can create complete database systems within which you can add, delete, edit, display and print data with a minimum of data duplication on file.
Requirements: CP/M-86 or MS-DOS, and 128 Kbytes of memory.

dBase III
Distributor: Arcom Pacific
Price: $976
Features: The latest in the dBase family from Ashton-Tate extends the concept of dBase II. It runs only on 16-bit machines and can have up to 10 databases open at one time. And it can have up to 32 procedures in a single file.
Requirements: IBM PC or XT, PC-DOS, 256 Kbytes of RAM, two floppy disk drives or one floppy and a hard disk.

Friday!
Distributor: Arcom Pacific
Price: $399
Features: Friday is written in dBase. An end-user, menu-driven package, it can be used to set up simple databases and produce reports, mailing labels and so on. Upward compatibility with dBase is a major attribute.
Requirements: PC-DOS or MS-DOS

KnowledgeMan
Distributor: Hisoft, Database Management Services, and others.
Price: $972
Features: The syntax used with this program is similar to that used with dBase, but Knowledgeman can have more files open, larger files with more fields, and it has a built-in spreadsheet and statistical commands.
Requirements: PC-DOS or CP/M-86, 192 Kbytes of RAM and a 5 megabyte hard disk.

Delta
Distributor: Intelligence
Price: $950
Features: A data management system supporting transactional processing. Delta is menu-driven and runs on MS-DOS. Each Delta file can handle up to 32,000 records, 90 fields, 2000 characters per record, and up to eight transaction groups. Data entry is via masks. The program allows arithmetic and character processing, and it can be interfaced with word processors.
Requirements: MS-DOS, 128 Kbytes of RAM and two floppies or one hard disk.

Superfile
Superforms
Supertab
Distributor: Sunshine State Scientific Systems
Price: $668, $261, $261 (manual $50)
Features: a new British-made database management system for storing information on microcomputers. Superfile enables users to create their own forms on the screen with 'Superforms' and use them to enter, alter and retrieve information.

CustomSoft Findit Database
Distributor: CustomSoft Developments
Price: $895
Features: A comprehensive customer/client mailing package which gives control over all aspects of mailing operations. Customer data can be read from all other CustomSoft systems.
Requirements: CP/M-86.

SPSS/PC
Distributor: Sourceware
Price: $1645
Features: A statistical analysis package allowing interactive and fast processing and flexible file management, with extensive display facilities and comprehensive documentation. Raw data files and system files can be

transferred and received to or from the mainframe.
Requirements: IBM PC or XT, and PC-DOS or MS-DOS.

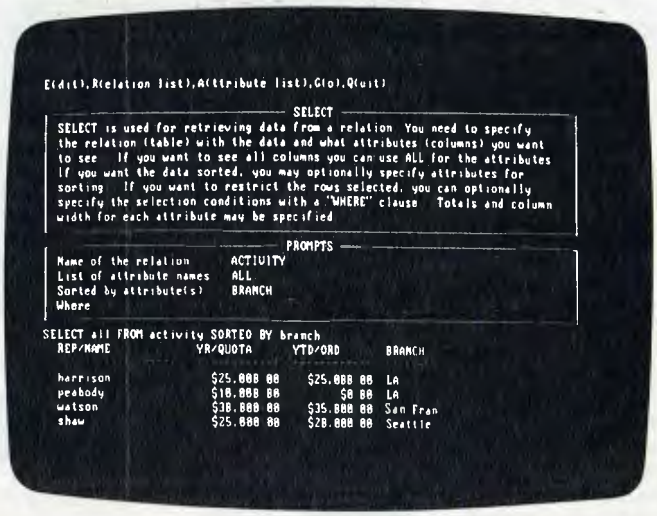
Perfect File
Distributor: Perfect Information
Price: $295
Features: Perfect File integrates with other Perfect software. It allows creation of a records management system to keep track of clients and so on which can be used for form letters, envelopes, lists, invoices and reports.
Requirements: IBM PC or XT

Quickcode
Distributor: Imagineering
Price: $380
Features: Enables you to create dBase II databases and application programs. It generates 12 different kinds of programs, including programs to transfer databases to WordStar mailmerge format, provide reports, create data entry screens and the like.
Requirements: dBase II

Rbase 4000
Distributor: Imagineering
Price: $630
Features: Series 4000 is a single-user relational database package with an optional package, CLOUT, which is a natural language query module and report generator.

Savvy PC
Distributor: Aladdin Computer Services
Price: $575
Features: An artificial intelligence database from Excalibur Technologies Corporation, Savvy combines an operating system, pattern processor, programming language and file and database manager into a single system. This integrated structure and the simplicity of the language significantly cuts programming time and simplifies development.
Requirements: IBM PC, XT or AT, with 128 Kbytes of RAM.

R:*Base 4000 help options.*



Microsoft Project
Distributor: Microsoft
Price: $415
Features: A project management package that allows you to build a schedule for any project. It revises and reorganises in seconds and has the ability to track activities that are critical to project activity.

Languages

DRI FORTRAN 77
Distributor: Arcom Pacific
Price: $517
Features: Digital Research's FORTRAN 77 is an ANSI-certified compiler, the main features of which are 8087 maths co-processor support, large program support, optimisation of small programs, overlay capability and extensive data type support.
Requirements: CP/M-86, MS-DOS, PC DOS, minimum 96 Kbytes.

Assembler Tools
Distributor: Arcom Pacific
Price: $298
Features: Assembler Tools is a collection of Digital Research program development tools for programmers, including the RASM-86 assembler, linker and librarian. Libraries of assembled programs are fully compatible with all Digital Research high level language compilers.
Requirements: CP/M-86 with a minimum of 128 Kbytes or PC-DOS with 128 Kbytes.

Microsoft FORTRAN
Distributor: Microsoft
Price: $550
Features: This FORTRAN 77 compiler is compatible with the MS-DOS and PC-DOS operating systems and includes floating point arithmetic, MS-DOS 2.0 file and overlay linking options as well as a number of enhancements including support of large arrays. It utilises the 8087 floating point co-processor to achieve faster numeric processing, and provides 8087-emulation software. Handles double-precision calculations needing high-level accuracy to 14 significant digits. Lets you create custom utility libraries and modularise programs with the library manager.
Requirements: MS-DOS

CBASIC Compiler
Distributor: Arcom Pacific
Price: $839
Features: This compiler for an enhanced version of the BASIC language is compatible with versions for CP/M-80 and -86. The compiler uses 14-digit floating decimal arithmetic, eliminating rounding errors in commercial applications. It does not require line numbers, supports local and global variables, and supports the Digital Research GSX Graphics Kernel system.
Requirements: PC-DOS.

Personal BASIC
Distributor: Arcom Pacific
Price: $234
Features: Personal BASIC is a general-purpose BASIC language interpreter. It is broadly compatible with the most popular BASICs, with differences in file-handling, system commands — which are more like DEC BASIC-PLUS — and editing. The system performs syntax checking on lines as they are entered, and refuses to accept incorrect lines.
Requirements: CP/M-86

Microsoft BASIC Compiler
Distributor: Microsoft
Price: $635
Features: The MS-Basic Compiler is compatible with the IBM PC BASIC interpreter. Both together form a powerful BASIC program- ▷

ming environment. You can write, run and debug your program interactively with the BASIC Interpreter and then compile it with the MS-Basic compiler to increase program execution speed and decrease memory space.
Requirements: MS-DOS

Microsoft-Pascal
Distributor: Microsoft
Price: $525
Features: This compiler from Microsoft has a full complement of functions making it suitable for both systems and applications programming. Specifically designed for the 16-bit microprocessor environment, MS-Pascal generally conforms to the ISO proposed standard (level 0). It offers extensive program development features such as: address types, constants and functions of ARRAY and Record types, SUPER ARRAYS, control flow features, separately compiled UNITS, variable length strings, and more.
Requirements: PC-DOS, 160 Kbytes memory, two disk drives.

Pascal/MT+
Distributor: Arcom Pacific
Price: $591
Features: From Digital Research, this is an implementation of the ISO Standard Pascal which produces relocatable modules that are then linked to produce native code. Supports both floating decimal and real arithmetic.
Requirements: CP/M-86, PC DOS

Prospero Pascal
Distributor: Oxford Systematics
Price: Around $600.
Features: In addition to all the features of Standard Pascal, the Prospero Pascal language has number of extensions which are important for 'real world' programming. It is a three-pass compiler and the software package includes, compiler, linker, librarian, run-time library, a source cross-referencer, and a utility to configure the software to suit variations such as differing disk capacities.
Requirements: CP/M-86, MS-DOS

Turbo Pascal III (New Version)
Distributor: Software City
Price: $120
Features: From Borland International, this package is a complete editor, syntax checker and compiler with high performance at incredible value. Includes useful extensions over the ISO standard. A matching Turbo Toolkit supports advanced features of the PC such as windowing.

Volition Systems Modula-2
Distributor: Ada Australia
Price: $566

Timewise project scheduling from Sybiz.

Features: The Volition Systems Modula-2 compiler accepts the full Modula-2 language with minor implementation restrictions. The Modula-2 system consists of a fast one-pass compiler, library manager utility, and a module library. Standard library modules provide I/O, program execution, storage allocation, strings, maths functions, and decimal arithmetic. Programs compile into P-code or native code depending on the host system.
Requirements: UCSD p-system

DRI PL/I-86
Distributor: Arcom Pacific
Price: $1063
Features: PL/I Subset G is a minicomputer standard subset of the popular mainframe language. The Digital Research PL/I compiler is a high quality implementation. The language offers modern Pascal-like control structures, but is less rigorous about GOTOs and type conversions than that language. Other features include stream and record I/O, together with formatted input/output. Data types supported include fixed binary, float binary (IEEE format) and fixed decimal.
Requirements: PC-DOS, MS-DOS, CP/M-86, CP/M-80

DRI C
Distributor: Arcom Pacific
Price: $535
Features: Digital Research's C compiler is a full Unix V7 standard C compiler with advanced features, including a sophisticated error-checking facility based on the Unix *lint* program. Runtime support library contains all functions, from input-output to transcendentals. The compiler supports the 8087 numeric data processor chip as well as the 8086 large memory model.
Requirements: 256 Kbytes to compile and link, CP/M-86 or PC-DOS.

Prospero FORTRAN
Distributor: Oxford Systematics
Price: Around $600.
Features: Prospero FORTRAN is supplied as eight files. The compiler is two-pass, taking a source file containing one or more program units and producing an 8086 machine code object file in relocatable form. It is possible to mix Prospero FORTRAN and Prospero Pascal within a program, and also to exchange files between programs written in the two languages.
Requirements: CP/M-86, MS-DOS

RM COBOL
Distributor: Pragmatix
Price: POA
Features: One of the most popular micro COBOLs, RM offers a wide selection of language functions and includes record lock and unlock for a multi-user environment. Highly portable, compiles to p-code.
Requirements: CP/M-86

Janus/Ada
Distributor: Ada Australia
Price: $830
Features: The package includes a multi-pass compiler, relocatable assembler and linker plus utilities and is itself written in Janus/Ada. The compiler provides a full set of logical, relational, membership and arithmetic operators.
Requirements: MS-DOS, CP/M-86, two floppies or a hard disk and 256 Kbytes or memory.

Microsoft C Compiler (Lattice)
Distributor: Microsoft
Price: $770
Features: The Microsoft C Compiler is a full implementation of C for 8086/8088-based microcomputer systems using MS-DOS.

Microsoft COBOL Compiler
Distributor: Microsoft
Price: $1065
Features: Lets you transfer your COBOL programming skills on mainframes and minis to microcomputers. Handles large numbers with the high level of precision you need for accounting and other business applications. COBOL accepts numbers up to 18 digits and maintains accuracy up to 30 digits during internal calculations. Allows you to link and run COBOL programs with Microsoft FORTRAN compiler, BASIC compiler or Macro Assembler programs.
Requirements: MS-DOS ▷

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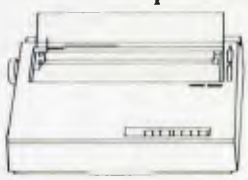

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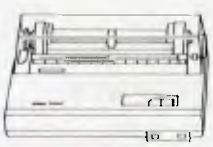

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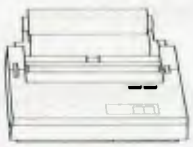

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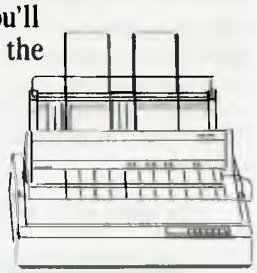

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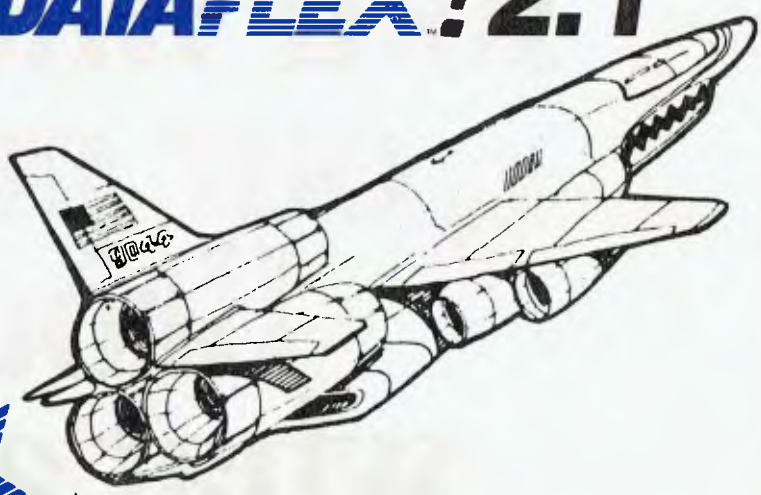

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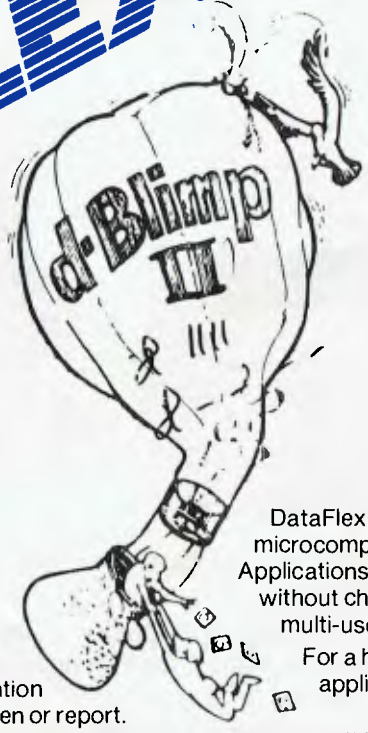

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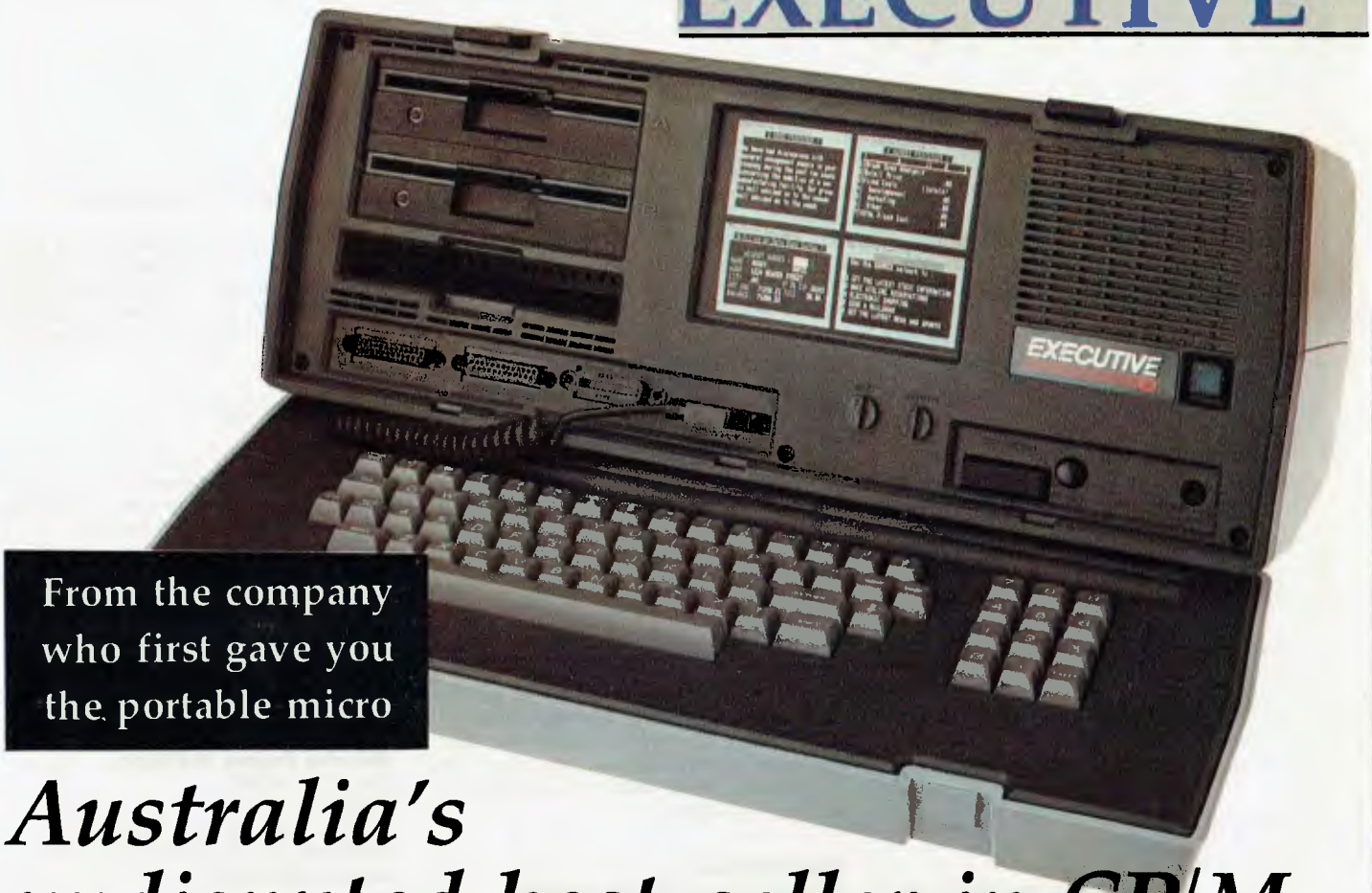

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LPA micro-Prolog
Distributor: Oxford Systematics
Price: POA
Features: One of several Prolog interpreters, this language is quite different from the standard DEC-10 Prolog. It is supplied with the Clark and McCabe book 'micro-Prolog: Programming in Logic' which is an excellent tutorial introduction to the language.
Requirements: PC DOS, CP/M-86

IBM APL
Distributor: IBM
Price: POA
Features: The IBM APL has the ability to exchange workspaces with the mainframe APL and also supports the 8087 co-processor.
Requirements: IBM PC

Waterloo APL
Distributor: HiSoft
Price: $650
Features: From the University of Waterloo, Ontario. An excellent package for learning APL, and supports the 8087 co-processor.

Waterloo Basic
Distributor: HiSoft
Price: $560
Features: Waterloo Basic is the only BASIC interpreter on the market for the 8086/88 based systems to offer 8087 support.

Dr Logo
Distributor: Arcom Pacific
Price: $318
Features: Dr Logo from Digital Research is primarily an educational product. The package includes turtle graphics, a visual programming package which lets the user command the computer to produce graphics. However, it also has business software applications, principally using its list manipulation capabilities. Logo is a structured programming language.
Requirements: IBM PC, 192-256K, single disk drive, mono/colour display, IBM colour graphics display monitor.

Xenix Development System
Distributor: Siromath
Price: $1350
Features: This system is comprised of a wide range of programs and commands to aid in the design and development of applications and system software.
Requirements: IBM PC XT

SBB Pascal
Distributor: Software Building Blocks Inc.
Price: POA
Features: SBB Pascal from Software Building Blocks Inc, for the IBM PC and compatibles is available in two versions. Version 1 includes the compiler, debugger, editor and the source code for the editor, while the other is a development package which adds separate compilation, overlays, 8087 support, BCD arithmetic and source code for the run-time library.
Requirements: MS-DOS, CP/M-86

Computer Innovations C
Distributor: Software Source
Price: $195
Features: Computer Innovations Optimising C is the closest of all the C compilers mentioned to the Unix 'standard'. Excellent support is provided through optional libraries for accessing dBASE II files, or the IBM PC hardware.
Requirements: MS-DOS, PC DOS

deSmet C
Distributor: CWare Corporation
Price: POA
Features: A fast, comprehensive and reliable compiler. It allows in-line assembly language statements and supports 8087 floating point. Despite its low cost, it is surprisingly good — as BDS C is to CP/M, so deSmet is to DOS.

Mark Williams C
Distributor: Mark Williams Company
Price: POA
Features: Standard compiler for the Coherent operating system which is a Unix look-alike. Available for DOS and CP/M-86.

c-systems C
Distributor: c-Systems
Price: POA
Features: Uses the full address space of MS-DOS machines and supports all the DOS 2.0 and 1.1 function calls. Features include the (optional) c-window, a dynamic debugger that displays source code, allows display and alteration of variables and lets the user set multiple breakpoints.

Instant C
Distributor: Relational Systems Inc.
Price: POA
Features: This optimising interpreter eliminates compile times and permits symbolic interactive debugging. A full-screen editor is integrated with the compiler so that syntax errors leave the cursor at the trouble area.

Small C
Distributor: Datalight
Price: POA
Features: Version 2.1 comes with complete source code for the library and the compiler itself and it features new 8086 optimisations and a standard library of functions.

UCSD p-System Fortran-77
Distributor: Oxford Systematics
Price: POA
Features: Pseudo-code compiler running under the p-system.
Requirements: IBM PC, UCSD p-system

Waterloo Fortran (WATFOR)
Distributor: HiSoft
Price: POA
Features: This FORTRAN interpreter is excellent for educational purposes. Supports the 8087 NDP.

MuLisp/MuStar
Distributor: Microsoft
Price: $415
Features: A language extensively used in the artificial intelligence area. It is the most powerful and fastest implementation of the Lisp system available for microcomputers.

Eco-C Compiler
Distributor: Cerebral Solutions
Price: $150
Features: Full and fast C Compiler. Extensive library functions and supports floating point.

Macro Assembler
Distributor: Microsoft
Price: $305
Features: A flexible assembly language development system.

Microsoft Business Basic Compiler
Distributor: Microsoft
Price: $770
Features: A powerful package used for development of business applications in BASIC.

Integrated Packages

Aura
Distributor: Imagic
Price: $795
Features: Fully menu-driven and simple-to-use integrated system. Supports spreadsheet (63 columns by 255 rows), word processing, database, graphics (business and free-hand) and a new communications package called Auracom adds communications facilities.

Symphony
Distributor: Imagineering
Price: $1095
Features: Successor to Lotus 1-2-3, Symphony combines a spreadsheet (256 columns by 8192 rows) with word processing, database (with form and mailmerge capabilities), 8 different business graphics types and communications facilities.
Requirements: PC DOS and one disk drive

Corporate MBA
Distributor: Intelligence
Price: $1200
Features: Corporate MBA incorporates a number of new features which extend the spreadsheet concept even further. Included with the spreadsheet calculator are built-in graphics functions, a personal database manager, word processor, windowing and a communications package (including IBM 3270-type mainframe comms with an IRMA board).
Requirements: PC DOS, 256K RAM

IBM Personal Decision Series
Distributor: IBM
Price: POA
Features: The IBM Personal Decision Series integrates several decision support functions, which includes a set of seven integrated packages based on a 'Data Edition' database manager program. The Series also includes an asynchronous communications package with data capture facilities.

Lotus 1-2-3
Distributor: Imagineering
Price: $835
Features: This popular program sold 60,000 copies in the first 3 months, and went on to become the standard for packages of its kind. Its spreadsheet has a theoretical maximum of 256 by 2048. It also incorporates a database which allows 2048 records of 256 fields and graphics that can be drawn directly from the worksheet.
Requirements: IBM-PC

T/Maker
Distributor: The Computer Factory
Price: $695
Features: The heart of T/Maker is its text editor. All data is entered and manipulated via the text editor regardless of which feature of the package you want to use. T/Maker's features include word processing, relational database management, spreadsheet analysis, a full range of mathematical functions, spelling checker and graphics.
Requirements: IBM PC with 128K of RAM

4-1-1
Distributor: The Software House
Price: TBA
Features: 4-1-1 works in conjunction with word processors and other document creation systems to maintain a database of every word used in every document in the system. Sophisticated document security system which includes archiving of documents while backing up.
Requirements: IBM PC or XT, 256K memory.

Open Access
Distributor: Software Suppliers
Price: $995
Features: Six packages are tied together here: word processing, database management, spreadsheet, graphics, time management and communications. Has a simple user interface. Good at handling large databases and spreadsheets.

Framework
Distributor: Arcom Pacific
Price: $995
Features: Framework from Ashton-Tate is a package that is similar to the Lisa desktop with pull down menus and simple user interface. Its features include word processing, spreadsheet, graphics, database, DOS access, sophisticated communications called MITE and FRED, a programming language which considerably extends the power of the package.
Requirements: IBM PC or XT, 256K of memory and dual 360KB floppies

Golden Gate
Distributor: Cullinet Software
Price: $1200
Features: Golden Gate is a fully functional stand alone package. The software includes a local relational database management system, document processing, full colour business graphics and communications facilities for IBM 3270 terminal emulation and asynchronous protocols.
Requirements: IBM PC, 320K RAM, IBM Colour Graphics card, hard disk, PC DOS, 3270 comms via an IRMA board interface.

Education

Knoware
Distributor: ASI
Price: $150
Features: Knoware from Knoware Inc. is a new game that is designed to give the user experience with spreadsheet, word processing, database management, BASIC programming, graphics and financial decision support.
Requirements: IBM PC

School Master
Distributor: Cypher Research Labs
Price: $100 each
Features: A series of five educational programs. An extra package for school administration purposes is available.

MuMath
Distributor: Microsoft
Price: $480
Features: Educational mathematical package.

Freddy's Puzzling Adventures
Distributor: Dataflow Computer Services
Price: $49.95
Features: This package is highly motivative and is designed to help small children grasp thinking skills such as planning, strategy and problem solving.
Requirements: IBM PC

Graphics

Graftalk
Distributor: Fagan Microprocessor
Price: $670
Features: This fully interactive graphics package supports a wide range of graphics screens, plotters and printers. Graftalk can produce bar and pie charts, line and symbol charts.
Requirements: MS-DOS, 128K

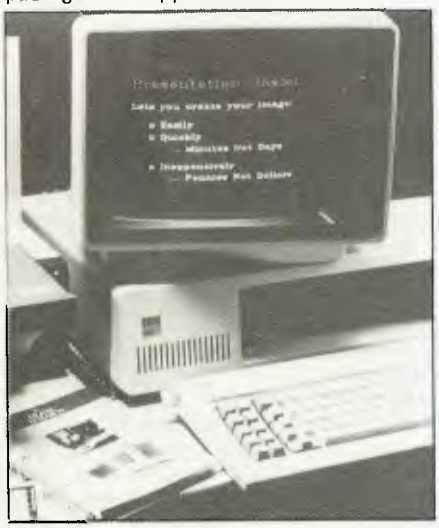
VCN Execuvision
Distributor: Prentice-Hall Aust.
Price: $632
Features: This product is a combination of graphics and file management. It features cut and paste options as well as sketching and text capabilities. Special add-on software libraries of pre-rendered images are available.
Requirements: PC DOS 1.1 and higher, 128K of RAM, 2 disk drives, colour monitor, graphics adaptor ▷

Presentation Master
Distributor: Arcom Pacific
Price: $2995
Features: Presentation Master from Digital Research allows the user to produce top quality 35mm slides through the use of the Polaroid Palette.
Requirements: IBM PC, XT, 256K of RAM, IBM colour graphics adaptor and colour screen.

DR Draw
Distributor: Arcom Pacific
Price: $443
Features: DR Draw from Digital Research is a keyboard- or mouse-driven package which allows the user to draw on the IBM graphics screen.
Requirements: MDOS or PCDOS

DR Graph
Distributor: Arcom Pacific
Price: $422
Features: DR Graph, another from Digital Research, is an easy to use and install package that is designed to to create presentation-quality graphs.
Requirements: Graphics Card, Graphics Monitor, 192K of RAM, 2 double sided double density disks

Microsoft Chart
Distributor: Microsoft
Price: $415
Features: A business graphics package that has 40 pre-designed charts available. Data can be created within the chart or it can be linked to Multiplan. Seven statistical functions are avialable to analyse data and data can be read from any of the following packages: dBase II, Lotus 1-2-3, VisiCalc or any package that supports ASCII files.



Digital Research's Presentation Master graphics presentation package.

Accounting

Genesis
Distributor: Cerebral Solutions
Price: $1985
Features: Genesis is a system for managing medical accounts, transactions and all types of billing. It is driven by menu selection with full screen display cursor control. A fee of $300 includes installation and training.

The Profit Centre
Distributor: Prentice Hall Aust.
Price: POA
Features: The Profit Centre is a flexible and menu driven series of packages all with uniform procedures and commands.
Requirements: 128K of memory, 2 disk drives and PC DOS

CustomSoft Fixed Assets Register
Distributor: CustomSoft Developments
Price: $1200
Features: CustomSoft Fixed Assets Register provides automatic calculation of depreciation at any stage of the financial year. It can handle up to 65,000 fixed assets and all details of each asset are saved in the system.
Requirements: CP/M-86

IAL Debtors/Sales Analysis
Distributor: Interactive Applications
Price: $795
Features: A comprehensive sales analysis (for example, customer groups), transaction analysis and line analysis including quantity, instant on-screen enquiries into customer details, ability to age inwards cash, credit notes and journals to the correct period. Also detailed audit trails and banking summaries.

IAL Order Processing System
Distributor: Interactive Applications
Price: $795
Features: Automatic generation of order confirmation, packing slips and invoices. Integrates with inventory Control and the Debtors Ledger to provide prices, discounts and stock availability when entering orders. Automatic updating of inventory records, multiple delivery addresses per customer provided for, instant on-screen enquiries as to the status of orders and comprehensive reports.

IAL Inventory Control/Purchasing System
Distributor: Interactive Applications
Price: $795
Features: Produces management reports (for example, product sales including gross margins or product costings showing variances between actual and standard and so on). Instant on-screen enquiries into complete inventory items details and access to inventory items by an alphanumeric code of between 1-15 characters.

IAL Free Format Invoicing System
Distributor: Interactive Applications
Price: $795
Features: This system is integrated with the Debtors/Sales Analysis System. Data is entered into the system and then invoices/credit notes are printed in the user's own format.
Requirements: PC DOS

IAL General Ledger System
Distributor: Interactive Applications
Price: $795
Features: Features user formatted reports allowing complete control over layout across the page and the sequence of reports down the page including the insertion of headings, sub-totals and totals, full range of 'standard' reports integrates to the Creditors Ledger and to the Fixed Assets System, batch control ensures ledger always balances etc.
Requirements: PC DOS

Business Modeller
Distributor: Business Model Systems
Price: $1950
Features: Business Modeller offers simplicity of operation with functional productivity. It allows the user to organise information, see the results of change, generate reports, form conclusions and maintain controls.
Requirements: IBM PC or XT, PC DOS, IBM 4300 (DOS/VSE/CICS)

Liberator
Distributor: Interactive Applications
Price: $250
Features: Interactive Applications' Liberator, part of the Charter Series of accounting packages, acts as a link between the charter programs as well as other packages like dBASE II, Wordstar, Multiplan and Lotus 1-2-3.
Requirements: Charter Series Programs

CustomSoft Accounts Receivable
Distributor: CustomSoft Developments
Price: $1200
Features: CustomSoft Accounts Receivable system features comprehensive management and financial reporting as well as other utilities. It can be interfaced with Customsoft's General Ledger and Findit databases.
Requirements: CP/M-86, hard disk recommended.

Power Software
Distributor: Powercorp Pty Ltd
Price: $2200

Features: This accounting package comprises five modules — debtors, stock control, general ledger, creditors and special purpose. Reports may be altered to suit the needs of the user and new formats may be created.
Requirements: MS-DOS

Padmede Business Control System
Distributor: Personal Computer Services
Price: $390 per module
Features: This system's five modules include: invoicing, debtors ledger, inventory/stock control, creditors ledger and general ledger.
Requirements: MS-DOS, PC-DOS

DocuCalc
Distributor: Sourceware
Price: POA
Features: DocuCalc from Sourceware is useful for those users who develop and document complex spreadsheet models and need to show their models to others and educators for training purposes. The user is able to document named ranges, macro locations, print set-up strings, margins and page lengths and so on.
Requirements: IBM PC, XT, MS-DOS, PC DOS

LeaseCat
Distributor: Catsoft
Price: $1895
Features: LeaseCat is a menu-driven system comprised of modules for lease classification, lease register maintenance and production of accounting entries and financial report disclosures.
Requirements: IBM PC, XT, minimum 192K of RAM, 1 disk drive

Meglas
Distributor: Computerland Eastern Suburbs
Price: POA
Features: Meglas is a multiple entity general ledger accounting system. It can handle a wide variety of different entities in the one integrated general ledger system. It features financial reports, audit trail and error checking and automatic balancing of loan accounts.
Requirements: IBM PC, XT, AT, 128K RAM, 2 disk drives

Sybiz, Symat and Sypay
Distributor: Trackfast Computers
Price: See description
Features: A fully integrated single or multi-user accounting package. It features the following modules — debtors, creditors, job costing, general ledger, inventory purchase order and back order systems. All these modules are $695 each. Also in the Sybiz range of products is Symat Bill of Materials ($890) and Sypay which is a Payroll system ($890).
Requirements: PC DOS

TABS
Distributor: TeleSystems Pty Ltd
Price: POA
Features: TABS (TeleSystems Advanced Business Software) is a menu driven database accounting system that can run single- and multi-user. Modules included are invoicing, stock, accounts receivable, accounts payable, general ledger, job costing, time recording and market management.
Requirements: IBM PC and networking software.

Attache
Distributor: Attache Software
Price: Pack I - $1595 Pack II — $1295
Features: This user friendly and flexible pack- ▷

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No games but everything else stocked at discount prices. We directly import 100 different lines and also deal with all the usual warehouses. Let us show you how your 64 can become a powerful business machine.

We normally have about a dozen different printers, 15 or so word processors, 20 or more spreadsheets and databases and about the same number of accounting systems, but can list here only the more popular.

VIATEL—1200/75 and 300 band direct connect modems with FREE databases time..... $299
—1200/1200 and 1200/75 acoustic couplers $199

BANNER MACHINE makes long printouts..... Disk $89
PRINT SHOP cards, logos, letterheads, etc ..... Disk $65
SUPERFONT Edit, save character sets ..... Tape $25
VOICE MASTER synthesises your own voice $99
SUPER VOICE MASTER Your 64 obeys you $199
CURRAH SPEECH 64 two tonnes..... $69
CASSETTE INTERFACE and DUPLICATOR $89
EPROM CARTRIDGE..... $39
C64 MOTHERBOARD 3-way $85, 5-way $169
PRINTER GRAPHICS UTILITY..... Disk/Tape $25
FLASH! 85 with built-in ON/OFF switch..... $169
CSM 1541 Disk Align Program $79
64 DOCTOR..... Disk $42, Tape $39
RABBIT (busts copy protect, loads tape fast)..... $75
ARROW (C64/VIC-20) faster still..... $79
MIND PROBER (also IBM, Apple Macintosh $89)... $49
PROTEK Acoustic Modem 1200/1200, 1200/75. ..$159
GEMINI 10X Printer 85 model..... $375
INTERFACES..... 12 different from $49
COMMANDER 11 disk drive, US made..... IN STOCK
MSB SUPER DUAL DISK DRIVE ..... IN STOCK
64K MEMORY EXPANSION for 64 and VIC 20 ... $299
CHARTIST Stocks & Shares prints graphs $149
COMPUTER STOCKS AND BONDS ..... Tape $39
COMPUTER MECHANIC $19
EDUMATE Light Pens the best..... $49
RAECO Screen Bump..... $45
NUMERIC KEYPADS 64/20 ... (4 keys $119, 18 $145
INTERCEPTOR SUPABASIC..... $29
SPEED BASIC ..... Disk/Tape $25
ULTRABASIC 64 ..... Disk/Tape $79

TATTS 40 or how to win a million..... $85
Detailed analysis of every Tattslotto draw, highlighting winning and losing combinations and showing how to discover the recurring patterns of three and four number series that come up more frequently than they should.

GENEALOGY PROGRAM..... $85
Produces 4, 5 and 6-generation family record charts to the printer or 4-generation charts to the screen. Fully indexed and with easy screen editing, 664 names, plus notes on each person, on each disk.

ASTROLOGY PROGRAM..... $85
(Also for Apple II+ and IBM Pc). Based on program used world-wide by professional astrologers. Provides individual horoscopes for all times and places. Much deeper than the pop-style 'sun astrology' you see in magazines. Basically geocentric but heliocentric is possible. Koch system of Houses and Tropical Zodiac but Western Siderial is an option. Student guide lets you ask the computer questions like: What does a Gemini rising sign mean?

SIMON'S BASIC..... $69
BLITZ! Fastest Compiler of all..... $99
6502 PROGRAM DEVELOPMENT CASSETTE $29
SPRITEMASTER..... $35
MAE 64 Macro/Assembler..... $85
VIC-TREE for programmers..... VIC $99, C64 $149
ZEUS Assembler (19 commands)..... $35
AUTOLOAD/DIRECTORY Cartridge..... $39
STARTER KIT for programmes..... Disk $25
TRAINING KIT..... Disk/workbook $29
32 PROGRAMS ..... Disk/Book $25
ALL THREE OF THE ABOVE $69
SARDON CHESS 3..... Disk $59
SARGON CHESS 2 Plays at seven levels..... $25
COLOSSUS CHESS 2.0..... Disk $29, Tape $25

PAINT BRUSH(Disk for VIC-20) $45
MILLIONAIRE The Stock Market simulation ... Disk $59
BARON Real Estate simulation..... Disk $59
TYCOON Commodity Market simulator..... Disk $59
TOUCH TYPING TUTOR Softsmith ..... Disk $24
IBN TYPING TUTOR Australian produced..... 8/T $25
TYPE ATTACK Learn to type while playing .... Disk $39
TYPING TUTOR/WORD INVADERS (VIC-20)..... $39
EDUCATION 1 ..... (Disk or Tape) $25
EDUCATION 2 ..... (Tape or Disk) $25
IVAN BERG EDUCATIONAL SOFTWARE $29
C64 EDUCATION TAPES Full set of 19..... $12.50
TOTL TEXT Enhanced. Best word proc. of all..... $59
TOTL SPELLER works with Easyscript, Bank Street...$45
TOTL KEYWORD CROSS REFERENCE $45

TOTL MAILING LIST/LABEL ..... Disk/Tape $45
THE MAILER..... Disk $49
LETTER WRITER..... Tape $19, Disk $22
HOME DIARY..... Tape $19, Disk $22
FLEET Fast, 4D, BB, cels $135
SUPER TEXT 80 column program..... $188
HESWRITER..... $55
WORDPRO 3 PLUS with Speliright..... $89
HOMEWORD..... $69
SOFTSMITH..... $49
EASYSCRIPT 64..... $89
OMNIWRITER/OMNISPELL..... $95
TOTL BUSINESS (Latest Compiled Version)..... $159
GENERAL LEDGER TOTL's newest compiled..... $69
64 ACCOUNTING by Software Design Inc..... $125
TIME/MONEY MANAGER..... $69
TOTL Time Management rated 4 stars .. (VIC $45) $29
HOME ACCOUNTS $45
PERSONAL ACCOUNTANT..... $34
CASH CONTROLLER..... $24
EXPENSE MANAGER..... $19
dialog TRANSACT book keeping system..... $45
dialog INVOSTAT invoices and statements..... $45
dialog STOCK-AID stock control inventory..... $45
BUSICALC: 1 — $55, 2 — $75, 3 — $99
AUTOCALC 64 ..... $45
MAGPIE famous British database, now for C64..... $99
dialog DFM DATABASE..... $45
dialog DATABASE+MAIL LABEL..... $49
TOTL DATABASE "RUN" says Best Buy..... $79
SUPERBASE 64 Mar '85 version..... $199
SUPERBASE STEPPING STONES..... $25

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age consists of Debtors, Invoicing Sales Analysis, Stock, Creditors and General Ledger that can be bought separately or in two bundled packages. Business Pack I has Debtors, Invoicing Sales Analysis and stock Inventory Control Business Pack II has the Creditors and General Ledger packages. In addition, Passport is suppplied free. This software allows exchange of data into other software. The modules are available on their own for $775 each, except Invoicing Sales Analysis which is $425.

Magnabiz
Distributor: Ilehead Pty Ltd
Price: Special June price $695, normally $775
Features: A simple, fully menu driven accounting system for small businesses. Designed to provide complete record keeping and report facilities for small to medium-sized trading ventures.
Requirements: IBM PC or compatibles

HiFinance 3
Distributor: HiSoft
Price: POA
Features: This fully integrated system has Debtors/Order Entry/Invoicing, Inventory, Creditors/Purchase Order Entry, and General Ledger and can be integrated with Lotus 1-2-3, Multi-Location Stock and Job Costing.
Requirements: IBM environment

IMS Ascent
Distributor: IMS Computer Systems
Price: All core modules $500
Features: This modular and integrated system is comprised of the following core modules — Debtors, Creditors, Stock Control, Cashbook and General Ledger. The system can also be integrated with other programs such as financial reporting and modelling (Microplan) database languages (dBASE II) and word processing packages like Word Manager and Wordstar.
Requirements: MS-DOS

Carpe Accounting Software
Distributor: Carpe
Price: POA
Features: The Carpe General Accounting and Management Information system is an integrated accounting system specially designed for the small to medium-sized business. Carpe is an on-line system that readily lends itself to computerising other significant application areas. It features four modules which include Stock/Inventory system, Debtors system, Creditors system and a General Ledger system.

IAL Bill of Materials
Distributor: Interactive Applications
Price: $795
Features: This package provides you with production information when you need it — improved efficiency, better materials management, better factory paperwork in a system which is integrated with the inventory/purchasing system and contains details of the components and sub-assemblies making up products, their relationships, costs, margins and selling prices.

Payroll
Distributor: Interactive Applications
Price: $795
Features: Comprehensive range of departmental costing reports, personal record keeping, detailed user-formatted payslip, alowances/deductions reports (including direct credit schedule), multiple rates for each employee, and so on.

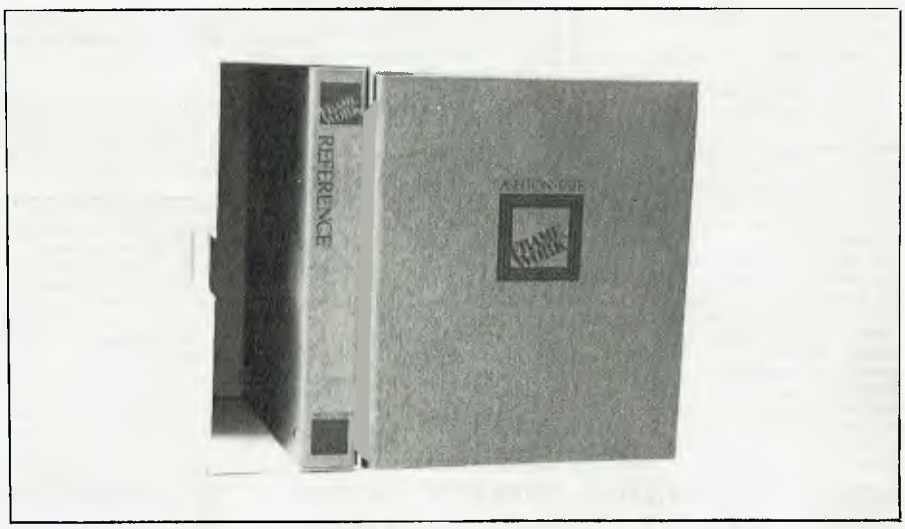
Local Area Networks

Janet
Distributor: HiSoft
Price: POA
Features: JANET (Just Another NETwork), developed by the University of Waterloo, supports a 10 Mbyte or larger hard disk. Each user has up to four virtual drives, defined by an ACCESS command. Up to 30 PCs are supported on the network, which utilises a base band bus, based on IEEE-488 (HP-IB) cabling.

Corvus Omninet
Distributor: Horizon Computers
Price: See above
Features: The Corvus Omninet networking system allows up to 64 workstations to be connected. It uses twisted-pair cabling and has a data transmission rate up to 1M bps using a CSMA/CD access method. Network management software is available to allow computers using different operating systems to share the network. Installation, which includes 11.1 Mbyte hard disk and one transporter card, costs $4060, plus constellation to networking software — $390. Any extra PCs added need an additional transporter card — $790.
Requirements: DOS or CP/M-86

ARCNet
Distributor: Datapoint
Price: POA
Features: ARC net uses a coaxial cable to link processors and peripherals in a base band network. It has a transmission speed of 2.5 Mbit/sand up to 255 workstations can exist on the one network, which can span up to four miles. While primarily intended to link-Datapoint products, IBM PCs can now be added to the network.
Requirements: DOS

Nestar Plan 2000, 3000 and 4000
Distributor: O'Reilly Computer
Price: POA
Features: The Nestar range of local area networks consists of three network systems based on the well-tested ARCNet hardware. Plan 2000 links two to six PCs, while Plan 4000 links up to 254 PCs. Both systems have a transmission rate of 2.5M bps and use a coaxial cable to link computers and peripherals. Plan 3000 offers some powerful software features including spooling and print queuing to dedicated print servers, and dedicated communication serverstations allowing connection to mainframes and electronic mail facilities. The system utilises star topology and token-passing access.
Requirements: PC-DOS



Ashton-Tate's Framework—one of the most popular of the new integrated packages for the PC.

Fox 10-Net
Distributor: SCA Software
Price: $1195
Features: Transmission rate is 1 Mbit/s; CSMA/CA system based on twisted-pair cable. No dedicated file server is required, as each PC runs both user and server software concurrently. A matching database for 10-Net, called 10-Base (see above) is also available, based on IBM's SQL database language.

3COM EtherSeries
Distributor: Imagineering
Price: Share $850, Mail $1125,
Features: Uses the Ethernet standard to provide DOS commands which operate across the network transparently to the user. Data transmissions 10 Mbit/s, using coaxial cabling. Software includes EtherShare for sharing hard disks on the network; EtherMail; and EtherPrint, which acts as a print spooler on the network server.
Requirements: Interface card required by each workstation andnetwork server

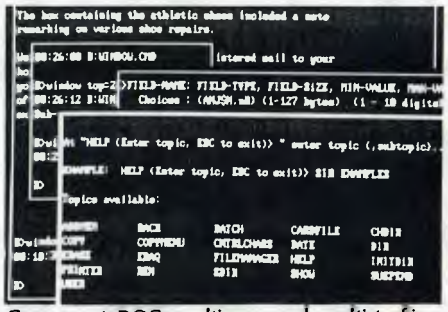
PC-Net II
Distributor: Sourceware
Price: $2850
Features: PC-Net II is the latest version of the network developed by Orchid Technology for the IBM PC. Based on base band bus technology, it can link up to 160 PCs over distances of up to 2500 feet (around 760 m). Software supported by the network includes electronic mail, file transfer software, and record and file locking.
Requirements: PC-DOS

Sytek
Distributor: IBM
Price: POA
Features: This is the system adopted by IBM as the IBM Personal Computer Network. A broadband 2 Mbit/s network operating on coax cable,it supports up to 255 workstations.

Communications

DataNetComm In/Modem
Distributor: DataNetComm
Price: $848
Features: DataNetComm In/Modem is extremely simple to use and install. It emulates the Hayes Smart Modem and meets the CCITT standards in use in Australia. Other useful features are telephone number look-up, auto-dialling, re-dialling of last number and automatic log-on facilities.
Requirements: IBM PC

Prestel/Videotex Emulator
Distributor: Archive Computers
Price: POA



Concurrent DOS—multi-user and multi-tasking operating system for the IBM.

Features: The emulator works with the DataNetComm modem In/Modem, and is supplied with the In/Modem to allow access to the many Prestel/Videotex services.
Requirements: DataNetcomm In/Modem or other Hayes-compatible modem

Modem 7 & PC Talk III
Distributor: Public domain
Price: POA
Features: Public domain utilities used for file transfer between microcomputers.
Requirements: PC-DOS

Remote PC Link
Distributor: McCormack & Dodge
Price: POA
Features: Remote PC Link is designed to link PCs to mainframes and to work with McCormack & Dodge's Millenium package. The user can gain selective access to data in a real-time environment, then reformat and manipulate mainframe data before it is downloaded to the PC. Spreadsheet and graphics capabilities are also featured with the package.
Requirements: IBM mainframe

Perfect Link
Distributor: Perfect Information
Price: $169
Features: This asynchronous telecommunications program allows the user to connect his/her computer to large computer systems or to other microcomputers. It uses standard ASCII data encoding structure and includes a wireless disk file transfer program.
Requirements: IBM PC, XT, 128K RAM, RS232 cable and phone line, auto-dial or manual-dial direct-connect modem.

Crosstalk
Distributor: Sourceware Pty Ltd
Price: POA
Features: Crosstalk is a data communications program which communicates with microcomputers and remote mainframes and online databases. Crosstalk features automatic dial and log-in and auto-answer.
Requirements: MS-DOS, PC-DOS, CP/M-86

Attachmate-3270
Distributor: Distributed Data Processing
Price: $1950
Features: This system allows personal computers to obtain 3270 PC functionality. Attachment 3270 is a coax-interface board that adds PC-to-mainframe windows to an IBM PC, thus allowing it to function like an IBM 3270 PC.
Requirements: IBM PC, XT

PC-Works
Distributor: Insystems Pty Ltd
Price: POA
Features: PC-Works allows IBM PCs to be attached to System 100 and System300 multi-user Unix systems. The network server program allows PCs to communicate with other PCs connected to the host and other Unix system users.
Requirements: PC-DOS 2.0, MS-DOS 2.0

Focus, PC/Focus
Distributor: Computer Power
Price: $85,000, $1975
Features: Focus is a mainframe product for IBM MVS and CMS systems. It is a database management system with some 4GL features; it also incorporates facilities for ad hoc enquiries, formal printed reports, graphics, statistical analysis and financial modelling. PC/Focus is functionally the same as the mainframe version, with the exception that some numerical limits in PC/Focus are smaller than in the mainframe version.
Requirements: PC/Focus requires PC-DOS 2.0 or higher, 5 Mbyte hard disk, 320 or 360 Kbyte double-sided disk drive, minimum 512 Kbytes RAM.

micro-FCS
Distributor: EPS Software Consultants
Price: $2500
Features: A financial modelling language that was originally developed for mainframes and is now available as micro-FCS.
Requirements: MS-DOS, 192K RAM.

IFPS/Personal
Distributor: Execucom Systems
Price: $1495
Features: Interactive Financial Planning System as used on mainframes. The micro version will communicate with the mainframe system, whichin turn provides links to corporate databases, general ledger, and so on.
Requirements: IBM PC, 512K RAM, two 360 Kbyte diskettes.

Answer/DB & VisiAnswer
Distributor: Datec
Price: POA
Features: VisiAnswer operates on the IBM PC and Answer/DB on IBM mainframes. VisiAns- ▷

AVERAGE MUSICIANS DON'T OWN A CX5M.

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The Yamaha CX5M is an extremely versatile computer designed especially for musicians.

And especially for those musicians who are particularly serious about synthesised music.

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programmes ensure that its applications to your music are endless.

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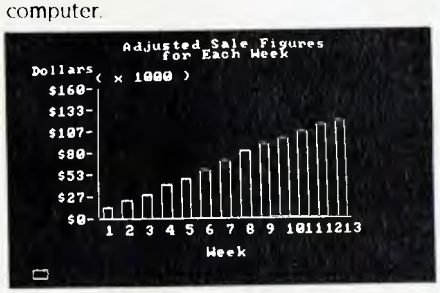
wer provides a user-friendly human interface on the personal computer, helping the user formulate queries and select desired data. Answer/DB selects and extracts data from any database maintained on an IBM mainframe, summarises it and downloads it to the PC running VisiAnswer.
Requirements: IBM PC and IBM mainframe

Lotus/Answer
Distributor: Datec
Price: POA
Features: Lotus/Answer is for Lotus 1-2-3 and Symphony users.
Requirements: IBM mainframe, IBM PC XT, PC-DOS 2.0 or 2.1

dBase/Answer
Distributor: Datec
Price: POA
Features: The dBase/Answer system contains three parts: dBase/Answer on the personal computer, the Answer/DB extractor on the mainframe and a communication line in-between. It is a menu-driven system of screen displays that require a minimum amount of typing and little dBase/Answer experience.
Requirements: IBM mainframe including DL/I, ADABAS, VSAM, IDMS

Millenium
Distributor: McCormack & Dodge
Price: POA
Features: The Millenium package allows the downloading, manipulation and updating of data between an IBM mainframe and personal computer. It is the only package that allows both uploading and downloading of data which has been updated on the PC, and also incorporates the popular Lotus 1-2-3 business software.

pcMAINFRAME
Distributor: Atac Pty Ltd
Price: POA
Features: This package from Oxford Software connects IBM Personal Computers to mainframe computers running IBM's CICSteleprocessing monitor. The system allows users to download and upload files in a real-time environment between personal computers and the central host IBM mainframe computer.



Requirements: IBM PC, XT, IRMA 3278/3279 Terminal EmulatorBoard, or asynchronous communications card, or 3270 protocol converters, MS-DOS, PC-DOS 1.1 or 2.0, CICS/VS 1.4 or higher,DOS/VSE, OS/VS1/MVS, SSX

Project Management

Project Scheduler 5000
Distributor: The Software House
Price: $650
Features: Project Scheduler 5000 is designed to enable the user to forecast, schedule, control and track large projects quickly and easily. Over 5000 activities can be scheduled which can be spread over 10,000 time periods.
Requirements: PC DOS, MS-DOS, IBM PC

Milestone
Distributor: Software Source
Price: $295
Features: Maintains lists of jobs in memory for fast operation. Handles up to 200 jobs per project and uses GANTT chart displays which, along with printed reports, are excellent for communicating the project plan to a team.

Pertmaster
Distributor: Intelligence
Price: $1600-2000
Features: A sophisticated package with automatic time analysis, time analysis bar charts and resource histograms. Can merge networks.

MicroPlanner
Distributor: Intelligence
Price: $2500
Features: Handles up to 4000 activities, with multiple calendars per project, resource levelling, and network merging. Variety of report formats. There is an optional plotter driver module and sophisticated project editor.
Requirements: IBM PC

Miscellaneous

Norton Utilities
Distributor: Aardvark Computer Educational Software
Price: POA
Features: A set of utility programs which extend the normal DOS facilities. They are most useful when you need to look at or modify the actual data on a disk. Their use will give an insight into the structure of the DOS disk format.
Requirements: IBM environment

Sidekick
Distributor: Software City
Price: $89.95
Features: Sidekick is package that is designed to extend the functionality and usability of the IBM PC. It features a calculator, notepad, appointment calendar, an auto dialer and ASCII table.
Requirements: IBM PC, XT

Microsoft Sort
Distributor: Microsoft
Price: $330
Features: Professional sorting and merging facility.

Mind Prober
Distributor: Human Edge
Price: $69.95
Features: The Mind Prober is aimed at helping the user to better understand another person's behaviour and attitudes through a series of assessment questions. When the assessment is completed the program produces a personality profile in a printed report.

Expert Ease
Distributor: Human Edge
Price: $995
Features: Development software system builds expert systems by enabling the user to enter examples about given subjects. Areas in which it has been used include judging suitability of job applicants, investment decisions, delegating administration duties training employees, solving mechanical problems.

Vertical Market

Decision Series
Distributor: AUSDAT Computers & Commun.
Price: POA
Features: The Decision Series is a collection of modules, including Feeder Cattle, Land Lease and Dairy Ration. Each module is user-friendly and features expanded reporting options which include profit statement, cost/profit tables and 'what if' analysis reports.

Requirements: IBM PC, XT and AT portable

Worksheet

Distributor: AUSDAT Computers & Commun.

Price: POA

Features: Worksheet is a set of 14 modules that include Cash Rent Analysis, Chemical Mix Cost Comparisons, Cash Flow, Hog Plan, and Farm Metric Conversions.

Requirements: IBM PC, XT and AT

Dairy Star

Distributor: AUSDAT Computers & Commun.

Price: POA

Features: Dairy Star is a complete ration balancing system. The package comes with an extensive table of feedstuffs and their NRC nutritional specifications which can be added to or edited at any time.

Requirements: IBM PC, XT, and AT

Depreciation Log

Distributor: AUSDAT Computers & Commun.

Price: POA

Features: Depreciation Log is designed to maintain year round control of depreciation decisions and it monitors tax status months ahead of year end. Items can be searched for, reviewed and edited.

Requirements: IBM PC, XT and AT

Horizon Accounting

Distributor: AUSDAT Computers & Commun.

Price: POA

Features: A management and book-keeping system for up to 350 accounts. Multiple checking accounts can be handled as well as open accounts.

Requirements: IBM PC, XT and AT

Doctor

Distributor: Independent Micro-Computer Shop

Price: POA

Features: A medical practice management system which handles up to 20 partners and 35,000 patients. Features include appointmentbooking, payment receipts, daily banking deposit slips, patient profiling and notes and general medical accounting.

Requirements: IBM PC, MS-DOS

Math/Library, Stat/Library

Distributor: IMSL Inc.

Price: POA

Features: Math/Library and Stat/Library are a collation of Fortran subroutines for specific areas of mathematical and statistical-programming.

Requirements: IBM PC, XT, AT, DOS 2.0, Microsoft Fortran Compiler, 196K

FBS Forward/Back Order System

Distributor: Future Business Systems

Price: $595

Features: This system can work with the standard FBS Debtors and Stock Control Systems. The debtors invoicing is expanded to include a variety of other features including part invoicing and ordering and placement of complete new orders.

Requirements: MS-DOS ▷

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Produ Master
Distributor: Cypher Research Labs

Price: $1500

Features: Produ Master contains invoicing, credit notes and debtors and creditors. It is designed for the buying and selling of freshand perishable goods.

Requirements: MS-DOS

Aviation Master

Distributor: Cypher Research Labs

Price: $500 (Admin.) $1000 (Maint.)

Features: This system can be used with Cypher Research Labs' Finance Master and can produce a system to control the accounts and administration of a small to medium-sized charter firm. The package has two modules — Administration and Maintenance.

Requirements: MS-DOS

Broadcaster

Distributor: PSI Computer Systems

Price: $29,000

Features: This a complete system that includes software, hardware, free training and 12 months warranty on software. Broadcaster is designed to automatically provide placement of commercial spots taking into account client and product separation, rotation and priority.

Requirements: IBM PC, XT

FBS Doctors General Accounting System

Distributor: Future Business Systems

Price: $2995

Features: A general accounting package for entry of patients and related services. The system makes allowances for multiple doctors to the one patient and invoices are in line with medical requirements.

Requirements: MS-DOS

The Doctor

Distributor: Amfac Pty Ltd

Price: $13,374

Features: The Doctor system features appointment booking, payment, receipts for cash, cheque or Bankcard, daily bank deposit slip and immediate monthly statement printing. A hardware package is supplied which includes an IBM XT and two C. Itoh printers.

Requirements: IBM PC

Amfac-Chemdata

Distributor: Amfac Pty Ltd

Price: $13,650

Features: This pharmacists' system provides patient profiling, which includes address, conditions, allergies, prescription histories, concessional status, pension and repat number as well as amount owing. Other software includes General Ledger, Word Processing, Spreadsheet, Profit & Loss, Debtors Control, Creditors, full pharmacy dispensory function. A hardware package is supplied which includes an IBM XT and three C. Itoh printers.

Requirements: IBM XT

Law Master 1 and 2

Distributor: Cypher Research Labs

Price: $1500 (Master 1) $1000 (Master 2)

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Features: Law Master 1 is applicable to a wide range of legal aid services. It covers client history, case histories, budget expenditure and reporting and statistics. Law Master 2 is designed to meet the needs of commercial legal firms and covers areas such as time recording, creditors, debtors ledger and trust accounting and a legal library.

Requirements: MS-DOS

Insurance Master

Distributor: Cypher Research Labs

Price: $1500

Features: Insurance Master is a complete agency management system for insurance agents. It provides immediate quotes for life, fire and vehicle policies and has provisions for work in progress policies. It also features cash flow analysis and auto reminders of due dates.

Requirements: MS-DOS

Harvest Plan

Distributor: AUSDAT Computers & Commun.

Price: POA

Features: Harvest Plan has six interactive modules: Overhead Cost Allocation, Feeder Livestock Plan, Crop Plan, Farrow to Finish Plan, Dairy Plan and Total Farm Cashflow.

Requirements: IBM PC, XT, AT portable

FBS Newsagents System

Distributor: Future Business Systems P/L

Price: $1490

Features: The FBS Newsagents System features full debtor accounting including catering for cash and account customers and issuing receipts, detailed statements to current customers and sales reports of debtors by day, week, month and year-to-date.

Requirements: MS-DOS

Rag Trade Forward Order System

Distributor: Future Business Systems

Price: $895

Features: The Rag Trade Forward Order System allows entry of multiline debtor forward orders by order, style, colour and size for various delivery periods. A variety of reports are available including orders by debtors or style over user-selected ranges and various totals and summaries.

Requirements: MS-DOS

FBS Service Station System

Distributor: Future Business Systems P/L

Price: $1490

Features: Future Business Systems Service Station package includes a variety of functions such as both cash and account customers and the issuing of receipts. Access to customer details and debtors is via registration number and detailed statements can be generated for current customers.

Requirements: MS-DOS

Property Master 1 and 2

Distributor: Cypher Research Labs

Price: $500 (Master 1) $1000 (Master 2)

Features: Property Master 1 and 2 are real estate packages from Cypher Research Labs. Property Master 1 allows data manipulation on properties and buyers details. Property Master 2 Is a trust accounting system for companies that handle the sale and rental of clients' properties.

Requirements: MS-DOS

Atom II

Distributor: Travel Software Company

Price: $6000

Features: Atom II–the Automated Travel Office Manager–is an easy-to-learn system that keeps track of cash held for each client, daily transactions, accepts receipts and payment details and produces several management reports. The system can be linked to the Attache general ledger package and provides a complete accounting system for the user.

Requirements: MS-DOS

ICIS

Distributor: ACI Computer Services

Price: POA

Features: ICIS is an insurance system and it features detailed analysis of prospects, clients and policies. The total package includes the ICIS software, hardware, word processing interface and training courses.

Requirements: IBM-PC

Page Planner

Distributor: Computerland Eastern Suburbs

Price: $2995

Features: Page Planner is an easy to use typesetting program from Computerland Eastern Suburbs. It allows users to do their own typesetting and page layouts on disk which then can be sent to a typesetting firm for processing.

Requirements: MS-DOS, CP/M-86, IBM PC, XT, 128K and two 360K disk drives.

Clinical Computers Office System

Distributor: Hospital Computers

Price: POA

Features: The Clinical Computers Office System features printing of labels, forms, cards and Medicare forms, invoicing, receipting and banking accounts rendered. Mail merging and word processing facilities are also available.

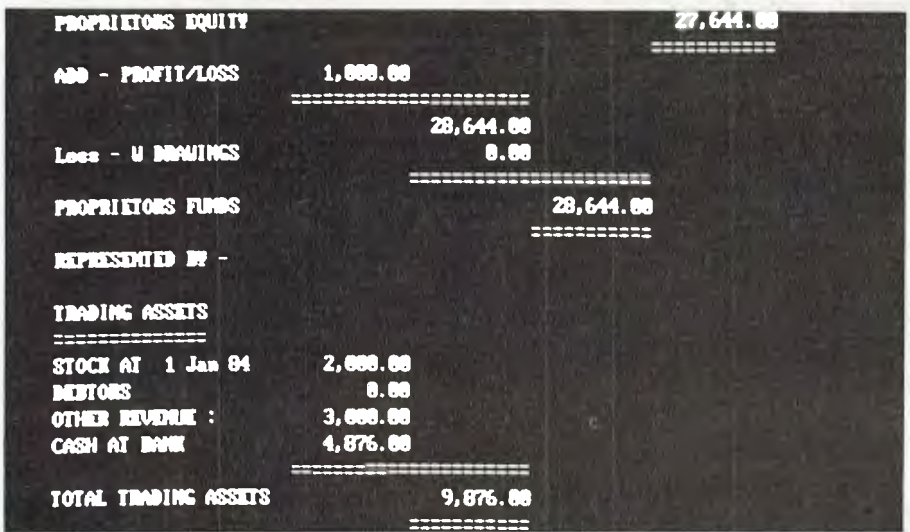
Requirements: IBM PC

HiMed

Distributor: HiSoft

Price: POA

Features: HiMed is a medical management package from HiSoft in Melbourne. The ▷



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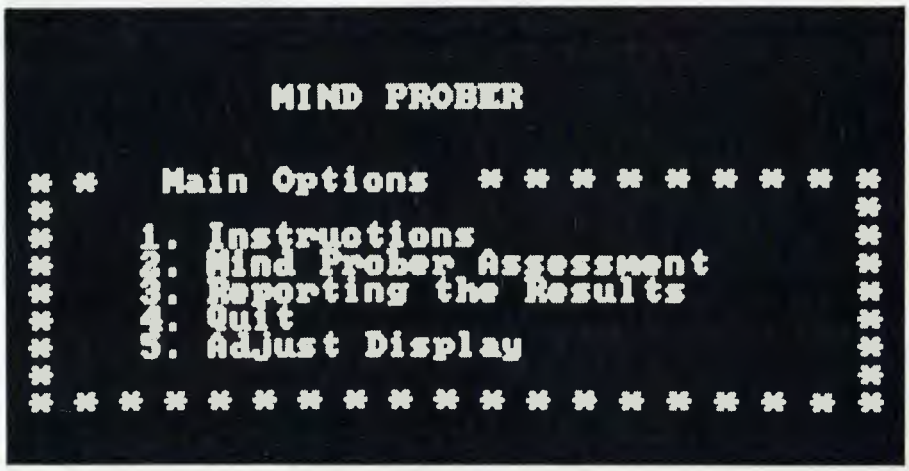


package was designed to accommodate 99 doctors on the one system. Some major features includes production of transaction statistics by any of the following categories: doctor, chargetype, item number and date. Invoices or statements can be produced after a consultation for payment by either cash or cheque.

Requirements: MS-DOS, PC DOS, 5 megabyte hard disk, 128Kbytes of RAM

Care Medical Systems

Distributor: Pace Computer Services

Price: POA

Features: Care Medical Systems is a practice management system that provides patient billing and Medicare billing as well as receipting and control and analysis of items and services per doctor. There is password protection on patient files and up to 23 doctors can be handled on the one system.

Requirements: IBM PC, MS-DOS, PC DOS

Front Desk Automation

Distributor: Systemedica Biomedical Engineering and Computing

Price: POA

Features: This package is designed for specialists or general practitioners. It gives instant accounts, receipts and bulk billing without end-of-day batching. Bar code labels are also produced.

Requirements: PC DOS, MS-DOS, 256K and a hard disk.

Medlog

Distributor: Systemedica Biomedical Engineering and Computing

Price: POA

Features: Medlog is a research-oriented information system. It is designed to keep patient history and monitors the disease process, therapy and responses treatment. Statistical analysis and risk factor analysis are also available.

Requirements: PC DOS 2.0, PC XT

Booking Master

Distributor: Cypher Research Labs

Price: $500 (Booking) $1000 (Food)

Features: A fully interactive hotel management system. Features include forward bookings, control of function rooms and guest security. Optional is a food and beverage control system.

Requirements: MS-DOS

Video Master

Distributor: Cypher Research Labs

Price: $1500

Features: Video Master is a complete video and rental system. It produces complete profit/loss reporting of each tape and of the overall business. Confidential reports are password-protected. It produces an overdue tape list.

Requirements: MS-DOS

SPSS/PC

Distributor: Sourceware

Price: $2000

Features: SPSS/PC is a well-known statistical analysis package which features interactive and fast processing, flexible filemanagement, extensive display facilities and comprehensive documentation. Raw data files and system files can be transferred to and received from the mainframe.

Requirements: IBM PC or XT, PC DOS or MS-DOS

Statpak

Distributor: Software Source

Price: $649

Features: Statpak is a library of various programs on statistics and probability calculation, discreet distribution functions, regression analysis, means testing survey data and contingency tables, non-parametric statistics and so on.

Requirements: PC DOS, MS-DOS

Microstat

Distributor: Cerebral Solutions

Price: $590

Features: General statistical package for microcomputers. Performs all statistical functions.

Dental Master

Distributor: Cypher Research Labs

Price: $1500

Features: Dental Master is used for patient billing. It is a single-user system.

Finance Master

Distributor: Cypher Research Labs

Price: $500 each

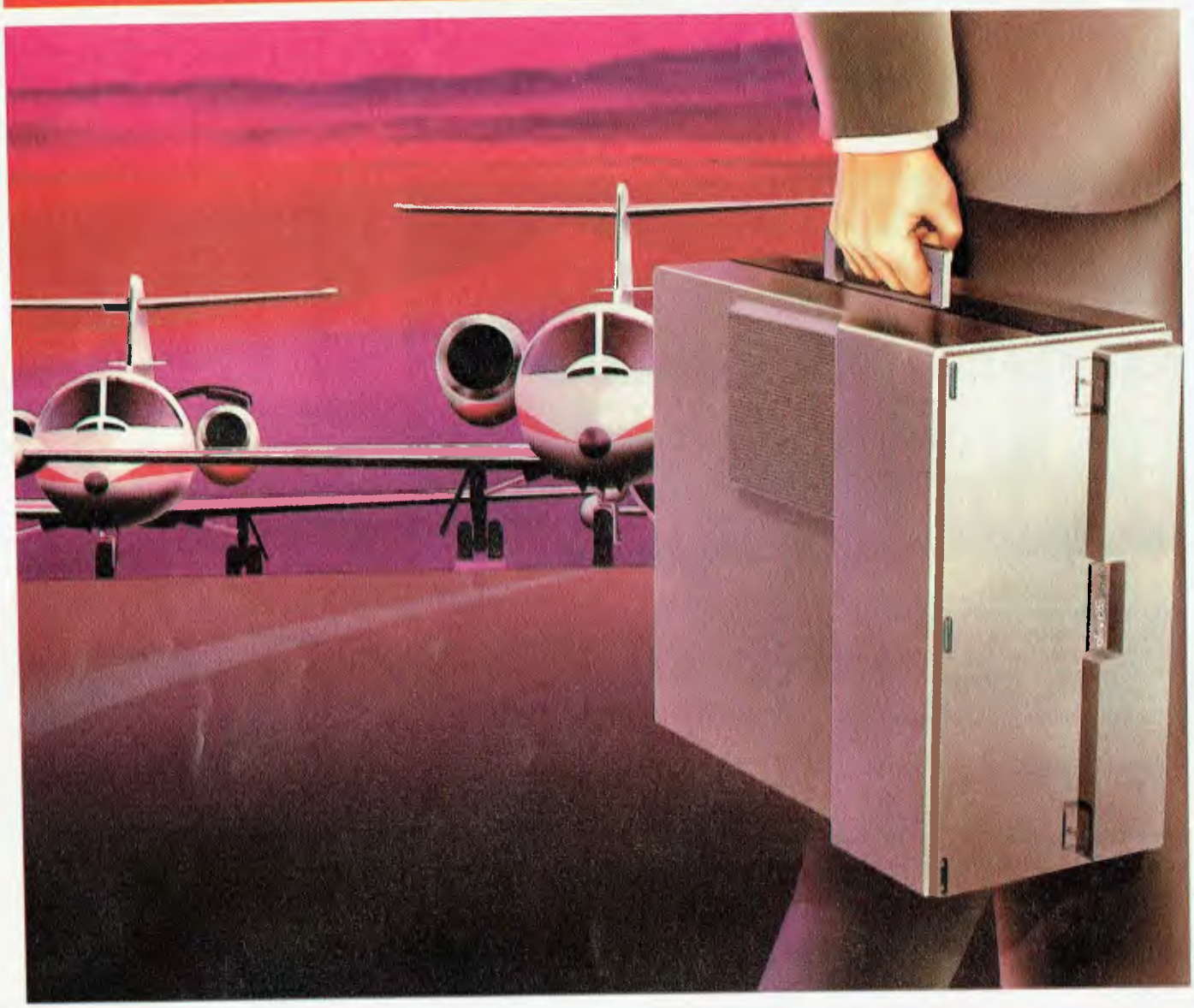
Features: This package has six modules:Debtors/Invoicing, Creditors. Stock/Ordering, Payroll, Job Costing, General Ledger.

The Communications Edge
The Sales Edge
The Management Edge
The Negotiation Edge

Distributor: Human Edge

Price: $450, $495, $495, $540

Features: Human Edge's Business Strategy Software is designed to improve a business person's skills with other individuals in interpersonal relationships. The Management Edge module is designed to improve supervisory techniques through real life problems. The Negotiation Edge evaluates the personalities, strengths and weaknesses of negotiators, both in one-on-one situations and in groups. The Communications Edge allows identification of strengths and weaknesses during meetings and conversations. The Sales Edge helps the sales person to adjust his sales instinctsand style to each individual customer. Each package comes with a manual and can be bought separately. □



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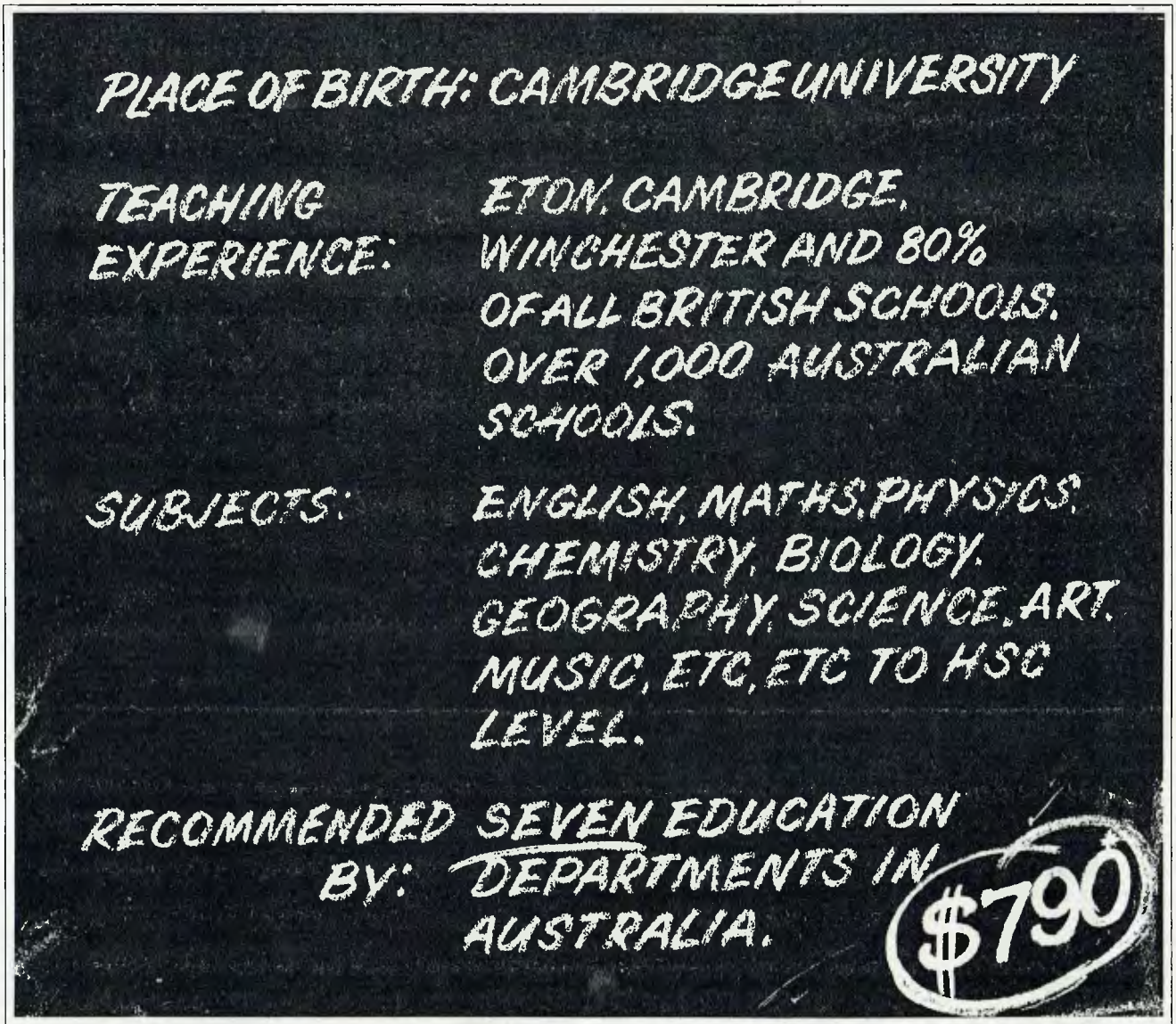

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Business

Medium Blues for Decentralised Computing.....72

Bread, pigs, steel, fodder — the Bunge group of companies found that medium-sized IBM machines installed in its scattered subsidiaries could well handle the requirements of these diverse industries.

By Norman Kemp

Anyone for a Blue Rinse? 74

The hum of an IBM PC has joined the more hair-raising roar of blow-dryers at The Cut Above hairdressing salon in Sydney.

Viatel Grapevine 79

In around three months Telecom should know if it's hit another goldmine. In the meantime, should you get under someone else's umbrella?

By Norman Kemp

MEDIUM BLUES for Decentralised Computing

THERE IS AN old saying about not sending a boy on a man's errand that is applicable to much of the popular wisdom about personal computers. Effective and impressive though the PC may be, it is still in youthful bloom compared with the performance of a fully-blown supermicro which runs several terminal and printer devices at will and has multi-user capabilities comparable with minicomputers or small mainframes. The marketing of supermicro business systems which can provide fast, interactive facilities when connected to mainframes, but are in the lower price range, is likely to be the major aim of commercial and industrial users for the remainder of this decade.

When the Bunge group of companies began the process of upgrading computer systems in its far-flung enterprises, requirements included on-the-spot power for various offices and efficient data transfer capabilities to give head office access to all information. As Norman Kemp discovered, Bunge was already an IBM believer, it was just a matter of which systems to choose.

This factor was realised by the Bunge (pronounced as in Bungh-ey) Group, of Melbourne, when it was planning an upgrade of its computing resources in diverse companies not only in Victoria but as widespread as New South Wales, Queensland, and Western Australia.

Bunge is a committed IBM user so the choice of brand was not a problem, but the type of new computer to handle applications at four sites operated by a group subsidiary, Bunge Industrial Limited, had to be carefully planned.

For several years the group's central computing facility has been located in Melbourne, with an IBM System/38 and large database being used for top-level reports prepared from information provided interactively by regional offices. Some of these had the durable but venerable IBM System/34s handling local batch processing, but were not equipped with the online communications facilities needed for group management information.

Microprocessors and Multi-user Terminals

The revised plan called for microprocessors and multi-user terminals which would allow the System/38 to function as a host head-office processor with management access to its database. The database would be updated interactively through regular telephone lines with information and reports from decentralised computers in each company.

Although the Bunge Group has a number of trading facets, the exercise outlined above revolved around four companies where System/34 minicomputers were deployed as the main computers for local needs. The companies are Sunicrust Bakeries, a bread supplier in Ballarat and other centres in Victoria; Herbert Adams, a flour milling and specialist bakery operation in Melbourne; the industrial subsidiary for fabricating and manufacturing firms, Union Steel, which is based in Sydney with offshoots in Queensland and Western Australia; and Fidelity Feeds and Fidelity Meats, companies in feedstock and piggery and abattoir businesses respectively, at Corowa, NSW.

During the early stages of consideration, two new IBM office microcomputers were available — the IBM PC and a significantly more powerful System/36, which was released in the United States in 1983 to come in above the IBM PC/XT. The System/36 models are supermicros featuring the most dense packaging of high-logic chips on any IBM, while being compatible with both the System/34 and System/38. Although priced at about twice the largest configuration of the XT, the System/36 range achieves economy through being able to connect to multiple devices, and through communications capabilities usually attributed to more expensive minicomputers.

The Power of Memory

"We looked at both machines and it soon became obvious that neither the IBM PC or XT, in any form, had the power needed for a large number of peripheral devices," said Ramsay Gunasekera, the Bunge group's business systems manager. "They were ideal for single-user applications, while the System/36 models 5360 and 5362 were designed with more memory and faster communications."

In mid-1984 Bunge began installing System/38 model 5360 computers (with 512 Kbytes of memory and 400 megabytes of storage), and the compact, or 'baby', model 5362 (also with 512 Kbytes, but with a 120 megabyte hard disk). IBM PC and XT computers were ordered for divisional managers to use in standalone applications.

Bunge's first order for System/36 computers was implemented by the cereal foods company, Sunicrust, at Ballarat. Ararat and Wagga Wagga branches followed, and all were linked by Telecom lines to a head office S/36. Since bread has an extremely short shelf life, quick

transfer of information assists not only in distributing supplies in carefully calculated quantities, but also in forecasting and ordering flour and other products to meet customer demands and trends, in arranging delivery schedules, and in maintaining control over rising costs in the baking industry.

Union Steel, a company long a part of the metals trade, had different requirements. The System/34 in Sydney was running almost to capacity in handling local orders, and was also linked to a steel plant in Wollongong, about 60 miles to the south. At about the same time, Union Steel in Brisbane had taken over product distribution for the Evans Deakin heavy industry complex, and an upgrade of its equipment was required.

The first Union Steel System/36 with two terminals and a printer was installed in Sydney in the second half of 1984, and the System/34 will eventually be replaced. In Brisbane, the upgrade has permitted implementation of 20 terminal devices to handle inventories and factory details of heavy industrial products, and administration of distribution.

It was through the Herbert Adams bakery installation in Melbourne that Bunge first started its association with IBM, when it ordered an IBM System/32 about eight years ago. In the course of time this machine was replaced, and present plans are for the installation of System/36 processors with 400 Kbytes of hard disk capacity.

Bunge's meat industries sector had previously purchased some software for the piggery and abattoir operations, but most of the systems written for the System/34 were able to be implemented on the System/36. "That was a big starting point in IBM's favour," Gunasekera said, "as some programs were very specifically designed for these operations and would have been costly to rewrite, or to have had to scrap." An example of these specific applications is a least-cost formulation program which allows the company's Corowa piggery to turn declining barley prices to advantage without requiring input to the central computer, or decision-making by senior management.

It was through Bunge's Herbert Adams bakery in Melbourne that the company first started its association with IBM.

Rapid Response Capabilities

The decentralised approach to computing Bunge opted for not only allowed an extremely rapid response to the diverse needs of the group, but also enables users to have greater control over the resources allocated to their needs, and therefore to become more efficient, said Gunasekera. It also means the head office is not committed to a large staff, while the regions can have a high standard of skilled service.

The number of System/36s and System/38s in Bunge's companies will increase over the next two or three years as the System/34s are phased out. By the end of this year Bunge Industrial will have a total of 16 larger micros, of which nine will be System/36s. In addition, about 10 IBM Personal Computers will be operating as standalone management processors at the head office.

The Bunge group has an annual turnover from its combined Australian and overseas operations of around $350 million. Its future planning includes extensive communications to speed the flow of information around its diverse companies and management networks. The mid-range supermicro will feature predominantly in office networks, and be boosted with more terminals for local processing as well as multi-user applications which will maintain a constant flow of information to the company's top-level management. □

Anyone for a BLUE RINSE?

The shears click, the hair dryers drone . . . and the disk drives whirr at The Cut Above, one hairdressing salon which has put a personal computer to good use keeping track of clients.

THERE ARE around 20,000 hairstyles stored on disk at The Cut Above, a Sydney hairdressing salon which has computerised its operations with an IBM PC-XT.

But the idea is not to provide you with infinite variety — instead, the system maintains a record of the last three visits of each of the salon's 7000 customers.

It saves hours of work each month — and a lot of space! Using a card system to store the records, for example, would require at least a whole filing cabinet. To

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mail out information to its clients without the computer — typing labels for 7000 envelopes, and returning the cards to their position in the file — would take at least two days.

The salon installed the IBM with a printer and a number of software packages including a dBase II system specially adapted for hairdressing requirements.

'The client records are extremely detailed,' said Mr David Pelerman, the owner and manager of The Cut Above.

'I know who they are, where they are, the history of their last three visits to the salon, the dates of the visits, exactly what was done to the hair, if a colour was used, and so on.

'The hairdresser can then look back at the records to know exactly what the client prefers for their hair and prepare for when the client is due to arrive for the next appointment.

'The records are also used as mailing lists,' added Mr Pelerman. 'If the salon is running a special promotion, regular clients can be informed in order for them to take the best advantage of it.

'Also if I decide to move the salon to a different location in the city, I can notify my clients and can be assured of many moving with me so I don't have to start business all over again.'

Mr Pelerman chose IBM hardware for what he sees as a simple reason.

'It's like buying a car,' he explains, 'when you go to all the dealers and they tell you their car is as good as one other, naturally you buy the one the others are compared to.

Everywhere I went, the computer dealers compared their products with IBM, so I chose an IBM computer.'

Software used at The Cut Above includes PeachCalc (spreadsheet), PeachText (word processing), and Sybiz (accounting).

In the 18 months since the PC XT was installed, The Cut Above is still finding new ways to use the computer.

Hand Over The Payroll

'I do plan to use it for payroll calculation in the future,' Mr Pelerman said. 'I've been exploring other things, and developing new projects that are related to hairdressing but are beyond the normal activities of hairdressers.'

One of these projects is an agreement ▷

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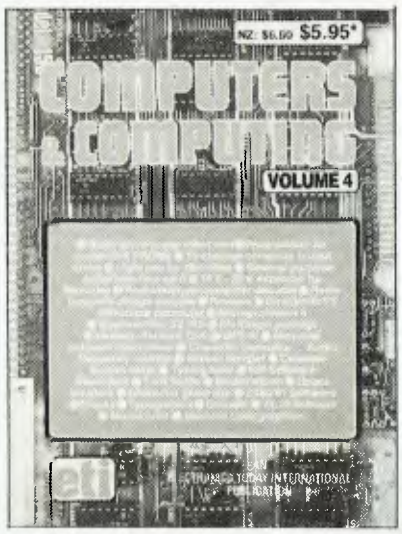

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Trade Enquiries Welcome

with a major retailer to franchise salons in its stores throughout the state. The spreadsheet function on the computer was used to make the cashflow projection and find the most economically viable option.

Another project is the formation of a club in conjunction with *Dolly*, a teenage girls' magazine, called Club Difusion.

'The computer is used to record the names and addresses of all the members of the club,' explained Mr Pelerman.

'Club members are offered discounted haircuts and are sent information such as general fashion news and latest styles from Europe, so again the database is used as a mailing list.'

However, the function Mr Pelerman values the most is accounting.

'The fact that it is possible to keep a day to day record of how the business is going, rather than having to wait for six to 12 months before an accountant told me, is very attractive,' he said.

'The weekly cash balances and general ledger account details are entered and then, every so often, Profit and Loss statements are produced. New projects can then be explored when the salon has the capacity.

'My next project will be to expand the capacity of the system, to double or triple the storage space because of the growing numbers of clients and club members.'

The use of a computer in a hairdressing salon is a novelty in Australia, although they are used extensively in salons overseas, says Mr Pelerman. □

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BY NORMAN KEMP

VIATEL GRAPEVINE

AT ITS FEBRUARY launch Telecom gave its potential Viatel audience a preview of the services available by circulating a users' directory containing tips on how to select and access the facilities as well as a detailed subject index. At this stage the listings are still a trifle ambitious — Telecom staff have not yet quite sorted out the techniques involved in building the databases — and some of the entries might not appear in reality for a few weeks.

But in spite of shortcomings, the directory is a tantalising overture to the wide choice of subjects videotex users will have around the end of June — by which stage Telecom expects to have almost 100 service providers and to have recruited around 2000 users, with a prospect of 10,000 users by the end of the year. If anything like these figures can be achieved, Telecom will have been more successful relatively than most other Prestel organisations in their first year.

In Britain, where it has taken nearly four years to get the Prestel service off the ground, British Telecom has announced an ambitious plan to connect the UK's 55,000 terminals to the 525,000 on the French Minitel network, for a regular exchange of traffic. Britain can already communicate with the Netherlands' Prestel-based videotex network, and France has reached an agreement with the West German Bundespost for interconnection between Teletel and Bildshirmtext. Inevitably, more frontiers will be crossed, not only within Europe but also between overseas countries, and eventually users in Australia may be able to access the farthest outposts of the world from their personal computers, for the cost of a telephone call and connection time.

Looking ahead to the next three months, with information based on the directory, the services available to users from Viatel will include such items as travel, business news, computer courses, banking and other financial services, games, teleshopping with credit cards, medical and occupational health information, government trade advice, and real estate. The first public access gateways to ICL Australia's Bulletin commercial videotex service and the Commonwealth Bank Home Banking Service will be operating in May, with other finance gateways soon to follow, including the ANZ Bank and Westpac. Some unavoidable delays were experienced in obtaining the GEC computer gateway equipment because of strikes which delayed Customs' clearances, but the first have become available close to schedule.

'There is a great shortage of computer people who can edit and design effective and pleasing videotex databases, and amateur efforts will only make the service look worse than it should be.'

Telecom expects that by the beginning of June the public will be aware of Viatel and interested in trying its services. Amid some criticism, Telecom opted for a low-profile launch on February 28, realising that very little information of general value would be on its databases at that time, and that premature publicity could cause a backlash which would detract from Viatel when it was about to become viable.

Other sections in the directory describe the origins of Viatel both in Australia and Britain, the New Zealand connection, Sydney hospital services, and the Telecom computer communications device for executives, the Computerphone. The directory is being updated and a new version is expected to be released in June.

Welcoming Kit

In addition to the directory, Telecom has added a 'Welcome to Viatel' kit for new users, as well as guideline brochures called 'Key Facts For Service Providers' and 'Key Facts For Users'. The neophyte is welcomed with a sealed envelope, which when opened reveals the secret customer identity personal password. Telecom requests that if the letter has been opened it be returned immediately for cancellation of the password. Also in the kit are five reference cards — presumably the first of a series — covering preliminary instructions for setting up a modem and computer, operating Viatel, special Viatel services, paying for Viatel and calling service difficulties. The Key Facts brochures explain the functions of Viatel in more detail, and the publication for providers can be used as a simple manual.

Many of the services on Viatel will be closed to the public, since they are being developed by government departments and private organisations as in-house communications channels. The ordinary subscriber, after paying a $12.50 fee for the first year for registration, will access Viatel through the appropriate gateways and a Prestel-type modem (remember, not all modems will work with this system, but the type required is generally fairly inexpensive), which will connect either directly to the frames of service providers, or to 'umbrella' providers. Experienced owners of personal computers should not have much difficulty learning to operate Viatel, and most of the machines sold in Australia are suitable. There should be no need to purchase a Prestel terminal and keyboard just for Viatel.

A bank manager is said to be a person who lends a customer an umbrella when the sun is shining and wants it back when it starts to rain. In videotex terms, an umbrella provider is a third-party provider approved by Telecom, who has acquired a substantial number of videotex frames; these are then contracted in smaller quantities to specialist information providers. The umbrella protection enables the specialist provider to contract for a smaller number of frames, and the umbrella provider usually handles the database design and other requirements. One of the first in this field is Paul Budde, of Roseville, Sydney, who came to Australia two years ago, having worked on videotex communications in the Netherlands.

Paul has started a consultancy service, which costs about $60 an hour together with the videotex charges, for firms which have a tentative interest in Viatel but don't wish to commit themselves to a major expenditure. He has also inaugurated Cable Shop, a credit card purchasing service; Busitex, for professional users such as accountants and lawyers; and Traveltex, which will be a database of accommodation, air fares and itineraries, and holiday tours. Similar umbrella providers are expected to join the service in significant numbers from June, covering other states.

Conceding that, as a practising consultant, he could be considered to have a vested interest, Paul said would-be service providers are well advised to get professional advice before trying to start their own databases. "In the beginning in Europe there were poor database designs, insufficient or incorrect information, dull ▷

colours and inelegant graphics, and all these faults are surfacing through inexperience on Viatel.

"There is a great shortage of computer people who can edit and design effective and pleasing videotex databases, and amateur efforts will only make the service look worse than it should be," he said. "Among the common mistakes is the omission of addresses for enquiries, or wrong routings of information from one frame to another. Technically Viatel can be slow at the best of times, and if the user is frustrated by badly designed frames there will be no encouragement to return to it. Service providers may need up to two years' experience and practice before they become really competent to handle the system, and they should not invest prematurely. By using umbrella providers until they gain the necessary familiarity they can save money in the long term and also assess the results more quickly."

About half the providers Paul Budde Communications has contracts for are in computer or videotex areas. Among companies which have signed are AWA, Sperry, Thorn-EMI, GEC Digital Consolidated Electronics Industries, Philips, Visionhire and Sony. A computer education course, Teachip, developed by two Sydney schoolteachers, is also available. Designed for the BBC microcomputer, the course includes an electronics manual and general literature on the use of computers.

An unusual variant is an Adelaide motel, the Portobello, which is advertising the availability of videotex terminals in its rooms, together with full business videotex facilities for conferences. A Sydney vendor, Antelope Engineering, is announcing the importation from Holland of a Secom database computer with eight ports for videotex and 5000-frame storage capacity, for $10,000.

Several companies are planning to put games on the system but, according to Paul Budde, these might not be commercially attractive as it's likely individual service providers will include games on free time as an inducement to users to connect to their product announcements. One of the companies with a games proposal is ACE, based in Melbourne and run by communications consultant Tony Cohen.

Chicken or Egg?

In about three months the pattern of Viatel will be defined, and Telecom will know whether it has launched a winner. In theory, videotex communications should be a benefit to Australia, but at present it is a 'chicken and egg' situation, with each side waiting for the other to move.

Home banking may well prove too much of a novelty to appeal for some time, but other facilities could be valuable immediately; it is notable that the travel industry will be widely represented on Viatel, as on other videotex services, and with Australians' fondness for travel, information in this area could be a much sought-after service. Also in coming weeks, the ranges and prices of videotex hardware and software should become more definitive, and the outlines of the developing market should start to appear. □

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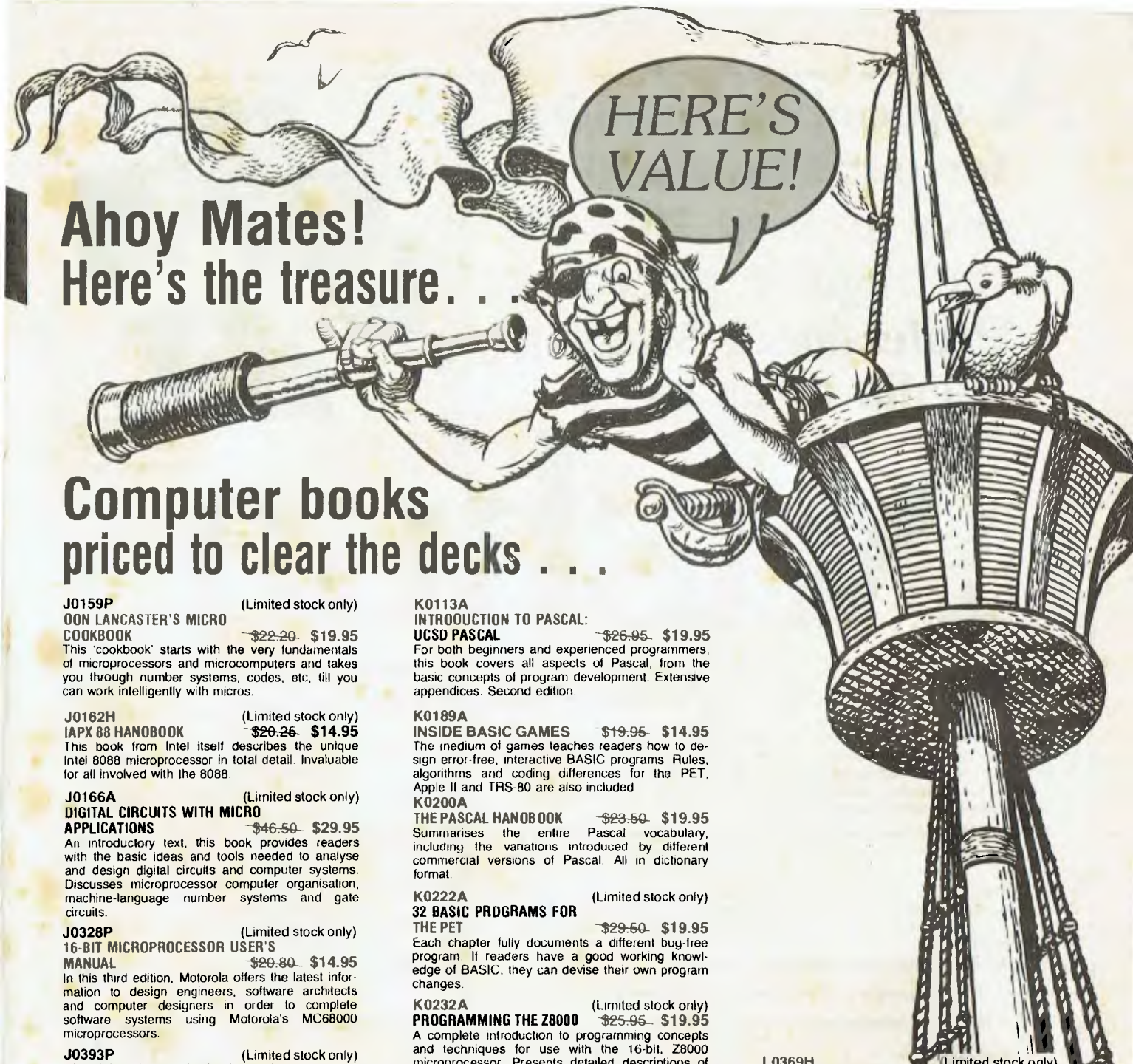

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Features

PC of the Year: The Users' Choice 118

Macintosh for Personal Computer of the Year, and Framework for Software Product of the Year — that's how the votes tallied when we surveyed representatives of Australia's top companies, government departments and academic institutions before we announced the real results.

By Matt Whelan

The Great Database Search: Condor.....120

The search revives with our promise of more databases than you'd care to poke a stick at in coming months. This time our database junkie, Rose Vines, tried out Condor. It's a neat package, with real power in some areas, but it isn't going to top our quest for the ultimate dBase II-beater.

By Rose Vines

Public Domain Software for the PC.....128

Gems or Junk? Actually, there's a lot of both in the world of public domain software, but who can argue with the price? John Hepworth starts off what will be a regular series examining specific software by giving an overview: what is public domain, how you find out more, and where you get it.

By John Hepworth

Programmer's Workbench.....134

Les looks at Operating System alternatives and enhancements for the IBM PC, including Concurrent DOS — which brings CP/M-86 and DOS together in a multi-user, multi-tasking environment — and TopView, IBM's window-managing answer to the Apple Lisa/Macintosh environment.

By Les Bell

Personal Computer of the Year: THE USERS HAVE THEIR SAY

Your Computer's Personal Computer of the Year judges got it all wrong! That's the opinion of almost 100 professional computer users/buyers who responded to a special survey we conducted before the award was announced.

ACCORDING to the 'users' — DP professionals representing some of Australia's top companies, government departments and academic institutions — the Hewlett-Packard portable should have finished fifth in the line-up for *Your Computer*'s PC of the Year Award!

In a surprise result they overwhelmingly selected the Apple Macintosh as their PC of the Year — a heart-warming result for Apple, which is currently doing its best to convince the business world the Mac is not just a pretty face.

They also rated Microsoft's Flight Simulator, winner of our Software Product of the Year, fifth.

It finished well behind Framework, Ashton-Tate's integrated package.

The survey was conducted at a cocktail party sponsored by *Your Computer* for delegates to the Australian Computer Society's PC '85 conference. At the party, we displayed the Personal Computer of the Year and Software Product of the Year finalists and offered the guests the chance to rate the products in their order of preference.

The results aren't necessarily the slap in the face they may seem to the YC judging panel: for a start, the Macintosh was given the most impressive display. Macintosh product manager Peter Sandys arrived early and set his machine up under a spotlight in centre stage — and spent the entire evening giving professional demonstrations of the machine rather than sipping on cocktails.

Interestingly, Framework distributor Arcom Pacific did much the same, with Bill Bolton demonstrating the product. There's no substitute for professionalism.

(It's also worth noting that both these gentlemen were part of the founding team of *Your Computer* writers — which suggests that either *Your Computer* produces professionals, or professionals produce *Your Computer* ... or both!).

Also relevant was the fact that for many delegates who had worked solely with mainframes and minis in the past, the cocktail party was their first 'close encounter' with these particular products. Anyone seeing the Mac for the first time — especially if they had never seen the 1984 Personal Computer of the Year, the

Top: DataNetComm's InModem, winner of the Commendation for Australian Hardware and (right) Typequick, which won the Commendation for Australian Software. Above: Panellists Dr John Barrett and Phil Grouse (left) and Peter Hunt of the ABC Radio Science Unit with Matt Whelan, Your Computer's managing editor.

Matt Whelan presents the award for Personal Computer of the Year to Richard Vincent of Hewlett-Packard, for the HP-110 portable.

Lisa — couldn't fail to be impressed.

Whatever the reason, the Macintosh romped home. It was nominated as the number one choice by 55 per cent of the voters, a resounding victory and a stunning indication of the Mac's acceptance in business circles.

Second highest vote-scorer was the Olivetti M24, one of our office favourites: 15 per cent of the voters picked it for number one. It was followed closely by the NEC APC III (12 per cent), the Polaroid Palette (seven per cent) and the HP110 (five per cent).

Those figures are based on first-past-the-post voting — on a preferential system it was much, much closer. The Mac was still well out in front, but only a few points separated the Olivetti, the NEC, and the Hewlett-Packard (which moved up to fourth place).

Framework didn't win as convincingly as did the Macintosh, but it scored tops with 25 per cent of the voters to edge out Open Access (22 per cent) and Symphony (15 per cent).

We also recorded some interesting comments on the voting forms (we promised not to tell about the man from IBM Australia who voted the Olivetti/AT&T M24 first, so we won't). Here's a selection of viewpoints.

First, let's hear from the cynics:

"*Epson should stick to printers; the Olivetti disk drives are upside down; Sidekick dies when you turn the PC off; Symphony needs a conductor; how do you get Flight Simulator off the ground?*" - Peter Sweeney, Clasp Enterprises. (Peter picked the software winner, even if he can't fly it...)

"*How did the Polaroid Palette get into the act?*" - several delegates asked this question in one form or another.

And now, the compliments:

"*The Palette represents the only truly innovative development in the past year.*" - Bill Bolton, Arcom Pacific.

"*The Macintosh has revolutionised the concept of business computing.*" - John Kingwell, Department of Defence.

"*The Apple Macintosh is the most innovative personal computer available.*" - John Twomey, Department of Housing and Construction.

"*Not an Apple user nor likely to be, but Macintosh is simply outstanding and is truly the way personal computing should be going. How mediocre everything else looks alongside it.*" - name withheld by request.

"*...have always had a 'hate affair' with Apples but in this instance the new developments that will make the whole industry (I hope) stop thinking of 'Big Blue' as the leader make the Apple Macintosh a worthy No. 1.*" - name withheld.

"*...Macintosh however is most needed for the users who do not really want to be users.*" - Patrick Swan, Sydney Water Board.

"*The Mac is the first machine I've got excited about since the late 1970s.*" - Stephen Withers, Computing Services, University of Melbourne.

"*The HP110, Apple Macintosh and Polaroid Palette get my vote because they are all, in their own way, innovative products. The same applies to Flight Simulator and Sidekick.*" — John Nicholls, Sun Alliance Insurances. (Hmmmmmm John, who reviews products regularly for *Your Computer*, picked an almost identical selection to our judges, yet he knew nothing of the result.)

"*What happened to the locked ballot box?*" - a comment from the Australian Electoral Commissioner, who obviously didn't care for our open cardboard box.

CONDOR: The Ultimate Compromise

We're back into the Great Database Search with a vengeance — we want to see a result, and see it soon! There are several more major packages to get through so, as we said last month, we'll be covering at least one (and often two) each issue from now on. This time our database junkie, Rose Vines, looks at Condor.

ALL DESIGNERS of commercial database packages must make compromises in developing their products. A system which is enormously powerful and flexible is unlikely to be a cinch to learn, while developers who opt for simplicity will have to restrict the users' options to some degree in order to maintain that simplicity.

So far in *The Great Database Search* most of the systems we've reviewed have emphasised power. Some, such as Optimum (November, 1984), have achieved this by sacrificing ease-of-use, others, including dBase III and Dataflex, have managed to balance these features, combining power and simplicity to some extent.

Condor Series 20/rDBMS Level 3 Version 2.11 **7 (what a mouthful) lies midway between the powerful and the simple — stressing neither of the extremes. It is probably the ultimate compromise: a moderately easy to use, moderately powerful database.

Condor is a system which appears to have been designed with the novice database user in mind — someone with a basic familiarity with their computer's operating system and the need to organise information for a small business or community organisation. It offers a number of really useful facilities within somewhat cramped limits.

A Familiar Environment

To start Condor, type 'DBMS' at the system prompt. You then have to enter a licence number (a tedious procedure, but preferable to systems such as Prolok) before the system starts. If you don't have a licence number, you'll be restricted to 50 records per dataset and you won't be able to empty or destroy datasets.

Once into Condor, you're greeted with a familiar prompt — the drive identifier followed by '>>'. If you start the program from drive A: the Condor prompt is 'A>>'. I found I kept on thinking I *was* at the system prompt, rather than in Condor.

This didn't matter much, because Condor has a neat interface with CP/M or MS-DOS and will run a number of the system commands. Type 'DIR' and a directory of all files will be presented. Type 'DIR *.dbm' and all the CONDOR commands will be displayed. To access other system commands, precede the command with a dollar sign. Condor maintains a 28 Kbyte work space for system commands; if you're running Condor under CP/M, you can use SPIP, STYPE or any other COM file within the size limit. If you have a word processor which fits into 28 Kbytes, you can use it from within Condor to create command procedures.

I should say at this point I was testing

Condor under rather strange conditions. The hardware in use was an Olivetti M24 (IBM compatible) with 10 Mbyte hard disk and a Kokusai terminal running as a virtual terminal from the Olivetti's serial port. The operating system was a beta-test version of one of the new whiz-bang systems. Occasionally some strange things would happen, especially when doing system calls, so I was unable to fully test Condor's interface with the operating system.

The Act of Creation

Condor is designed along roughly similar lines to dBase II, with an interactive command mode and a batch command procedure mode. What this means is it is possible to do most things in Condor by typing a command at the A>> prompt. It is also possible to string together a whole lot of commands in a procedure file, allowing automated operations and the easy execution of oft-repeated commands.

The starting point for setting up a dataset is the DEFINE command. Defining a dataset is done by typing DEFINE <dataset> and then drawing the data entry form on the screen. Figure 1 shows a sample DEFINE screen for a well-known magazine's contributors' payment system, with the dataset name 'Contribs'. Field names are enclosed in brackets, with the underscores indicating field lengths. Condor allows full-screen editing of the definition screen (on 16-bit computers two screens are available per dataset).

When you're satisfied with the form layout, type control-E. You then have to enter field types, sizes and default values. There are six field types available:

A	Alphabetic	A-Z, a-z, space, comma, hyphen, full-stop, quotation marks
AN	Alphanumeric	A-Z, a-z, 0-9, symbols
N	Numeric	0-9 (integers), +, −
N.n	Decimal Numeric	0-9 (integers), +, −, fixed decimal point
$	Dollar	dollar amounts with two decimals
J	Julian (date)	calender format

In addition, any field may be made a required entry (that is, it must be filled in) by typing R after the data type. Condor only allows dates in the American month first format, and care should be used when setting up accounting applications — in most cases the decimal numeric field type should be used instead of the $ field type which cannot take account of fractions of cents.

Once you have entered a field type, it is possible to set minimum and maximum and default values for fields. Default values can be no longer than 15 characters. Alternatively, Condor will enter a series of default values for you if you wish. Figure 2 shows the field definitions for the Contribs dataset. The $TODAY default in the DATE.PAID field automatically places the system date in this field during data entry.

Defining a dataset actually creates three files: a form file (.frm), a data definition file (.def) and a data file (.dat). It also writes a new record in the data dictionary (data.dic) — a special dataset which keeps track of all the files in the system and their relationships to each other.

To get information into the file, type ENTER <dataset>. Condor presents you with the previously defined form (minus the brackets), and once again allows full-screen editing. The same command is used whether a dataset is empty or already contains records. The APPEND command attaches the records of one dataset to the end of another similar dataset; COMBINE performs the same function but leaves the original sets intact and places the combined records in a RESULT dataset. The READ command will transfer records from a variety of ASCII formats (word processor or programming language files) to a Condor dataset. (The reverse procedure is also possible using the WRITE command, with a variety of different data formats available, including Mailmerge, BASIC, Pascal, RPG and Spellbinder.)

```
*****************************************************************
*                YOUR COMPUTER CONTRIBUTOR SYSTEM               *
*****************************************************************


[LASTNAME] ____________________    [FIRSTNAME] ________________

[SUBJECT] ____________________

[TITLE]   ____________________    ________________

[ISSUE]   ___              [PAGE] ___          [SIZE] ______

[DATE.REC] ________    [DATE.ACK] ______    [DATE.PUB] ________

[RATE]    _____        [PAYMENT]  ______    [DATE.PAID] ________

********** ******************************************************
```

Figure 1. A *sample* DEFINE *screen for a magazine contributors' payment system.*

The Basic Tools

As with all database packages, it is what you can do with the data *after* it has been entered which is the measure of the system. Condor has its own versions of the most common database commands (UPDATE, LIST, PRINT, DISPLAY, DELETE, SELECT, SORT, INDEX) plus some special features of its own.

The basic commands are fairly flexible, and the command syntax is easy to master, allowing a degree of leeway. For example, the following commands are interchangeable:

DISPLAY contribs WHERE SUBJECT IS Communications

DISPLAY contribs WHOSE SUBJECT-=Communications

DISPLAY contribs ST SUBJECT EQ Communications ▷

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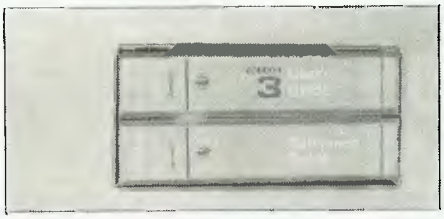


The 'ST' in the third example stands for 'such that'. Records may be listed one after the other using the original data definition form, or in a columnar format with specific fields displayed.

Some of these commands don't work quite as you might expect. If you INDEX a file, a subsequent SORT will invalidate the index, as will any command which works on the index key field (or fields). The index must then be rebuilt. With the DELETE command you can delete a single record or a number of records at a time. When deleting one specific record Condor asks you to confirm the operation. This safety procedure is useful because there is no way of recalling deleted records (as in dBase). However, when deleting a range of records with a command such as 'DELETE contribs WHERE issue IS 041' no confirmation is required. This sort of inconsistency is downright dangerous. SELECT performs much the same function as DISPLAY, but places the records which match your specified search criteria in a RESULT dataset. The RESULT set may then be saved under a different name, providing you with a subset of your original file.

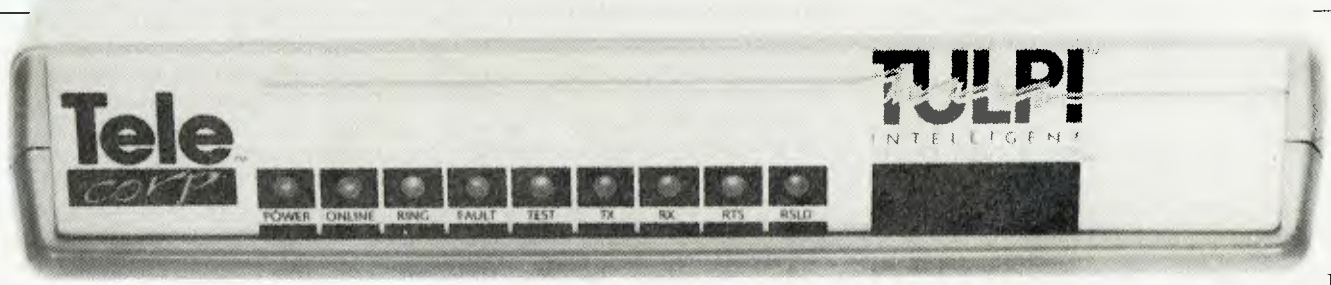
```
Enter data definitions in the following format:
>FIELD-NAME:  FIELD-TYPE, FIELD-SIZE, MIN-VALUE, MAX-VALUE, "DEFAULT-VALUE"
    Choices:  (ANJSN.nR)   (1-127 bytes)  (1-10 digits)      (0-15 Characters)

>1.LASTNAME: AR,20,1,20,"                    "
>2.FIRSTNAME: A,20,1,20,"                    "
>3.SUBJECT: AN,25,0,25,"                    "
>4.TITLE: AN,50,0,50,"                    "
>5.ISSUE: AN,3,1,3,"                    "
>6.PAGE: AN,3,1,3,"                    "
>7.SIZE: N.3,8,0,99.999,"                    "
>8.DATE.REC: J,3,01/01/00,12/31/99,"                    "
>9.DATE.ACK: J,3,01/01/00,12/31/99,"                    "
>10.DATE.PUB: J,3,01/01/00,12/31/99,"                    "
>11.RATE: N.2,8,0,999.99,"                    "
>12.PAYMENT: $,3,000.00,9999.99,"                    "
>13.DATE.PAID: J,3,01/01/00,12/31/99,"$TODAY"

14.{{ END }}

Definitions OK (Y/N)?
```

Figure 2. *The field definitions for the contributors' database.*



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Powerful Manipulators

Apart from these basic commands, Condor has a number of special commands which allow a lot of flexibility in manipulating files, and make the system especially suited to accounting applications. PROJECT creates a new dataset containing only specified fields from an old dataset. JOIN creates a new dataset by combining the fields of two datasets. A natural join occurs when the two existing datasets have at least one field in common: records are transferred to the new dataset if they match on the nominated field. A special join is made between datasets without a common field; in this case all records from the original sets will be included in the RESULT dataset.

COMPARE and POST are usually used together. Comparing two datasets will create a RESULT set of records which match on the specified field. The NOT MATCHING option will produce a RESULT set of only those records which do not match. This form of the COMPARE command is used before a posting operation to ensure the files will post correctly.

The POST command is a very powerful feature of Condor. It allows you to update a master file from a transaction file — probably one of the most common procedures needed in any financial application. For example, using the Contribs file and a transaction file 'Payments', the master could be updated with the command:

```
POST contribs payments MATCHING lastname firstname AND ADD payment
```

Condor is designed to encourage the use of transaction files, so the master is protected from the hazards of data entry, and a complete audit trail is maintained. The POST command creates a RESULT set which contains the original form of the master record and all subsequent changes made during the posting operation. Saving the RESULT set will provide a record of all changes made to the master. The original master will be updated to reflect the situation after all transactions have been posted.

Another major group of commands is the maths commands. COMPUTE is used to perform arithmetical operations (addition, subtraction, multiplication, division) on numeric, decimal numeric, dollar and Julian values. An example of a multiple compute statement is:

```
COMPUTE payments WHERE issue > 040 ST
payment (rate*size)+((rate*size)*9/100)
date.paid '05/21/85'
END COMPUTE
```

The STAX command provides basic statistical information on numeric, decimal numeric and dollar fields. The statistics provided are maximum, minimum, total and average. You can obtain statistics on 32 fields using one command. The TABULATE command produces summaries of the contents of fields and provides statistical information on those fields. The dataset must be sorted on the required fields before tabulating:

```
SORT contribs BY issue
TABULATE contribs BY issue AND COMPUTE AVERAGE payment, TOTAL payment, AVERAGE size, MAX rate
```

The COMBINE, COMPARE, JOIN, SELECT, POST, PROJECT, REORG (alters dataset definitions) and versions of a number of other commands use a RESULT set for the product of their manipulations. The use of the RESULT dataset is a crucial feature of Condor; it provides a high degree of protection for your files and maintains the integrity of your data. In the posting procedure it automatically creates an audit trail.

However, it uses one hell of a lot of disk space. I pity the person who tries to run Condor on a floppy-only system (especially one with skimpy 360 Kbyte drives). The Condor manual itself devotes a fair bit of time to what to do if you find your disk is full, or how to avoid such a condition. I think the best precautionary measure would be to run Condor *only* on a hard disk system.

A Report Writer with Muscles

The area where Condor shines is in producing reports. There are two levels of reporting available: the PRINT and TITLE commands, which offer simple report listings, and the REPORT command, which really isn't a command at all — it's the gateway to a complete report writing subsystem.

PRINT can do the same things as LIST. Used with TITLE it is possible to place multiple line headings on printed reports, set line spacing, issue form feeds, set page length and width, place the current date in a heading and provide page numbering. It's very easy to use and provides quite presentable quick listings.

If you want something more than a rudimentary report, the report writer will probably provide just what you need. Typing 'REPORT' brings up the Report Writer menu which gives you the choice of creating a new report, revising an old one, describing existing report specifications or printing/displaying a report.

With the Report Writer you can set page lengths and margins, create page headings, section headings, section footers, control breaks with subtotals, totals and rand totals and include computed fields and statistics. Fields can be left-justified, right-justified, left blank when zero, printed with leading zeros, asterisks or floating dollar signs.

Creating reports is dealt with in detail in the Condor User's Guide (almost a third of the guide is dedicated to the Report Writer). Formatting the report involves laying it out on the computer screen. Typing CTRL G will cause a grid to be displayed on the screen, which makes positioning items easy (the grid is also available when defining the form of a dataset). After you've layed out the report, Condor prompts you through the description of the report specifications, using the 'short' or 'long' methods. The short method allows Condor to automatically allocate certain default values, such as margins. The long method enables you to have complete control over the report specification.

I was very impressed with the Report Writer; it's a really useful system which is not matched in other databases I've reviewed. It's not the easiest part of Condor to learn, but it is certainly worth the effort. In fact, I wish *more* of Condor was as difficult to learn, if such difficulty is concommitant with depth and power.

The 90 Pound Weakling

If Condor's Report Writer is a heavyweight, its command procedure facility is the reverse. I'd heard others say Condor's command language was easier to learn than most other database languages. This is certainly true, as there is nothing much to learn.

Command procedures allow you to automate repetitive or frequently used series of commands. Many database packages have command languages which almost rival standalone language packages. Condor's command language cons- ▷

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ists of all the commands you can type at the A>> prompt plus the directives: *LET, *MESSAGE, *GET, *END, *ABORT and *IF ... *ENDIF.

*LET assigns values to variables (nine variables are allowed per directive). *MESSAGE and *GET are used to interact with the operator at the console. *END stops a procedure at the *END command while *ABORT stops the command processor without performing any of the commands. The way *ABORT works is an indication of how the the command processor operates: when you RUN a command procedure, Condor scans the procedure file to see which commands to execute, depending on the conditions specified in the command directives. These commands are then written to a temporary work file called $$.DBM (Condor once again being profligate with disk space) and run sequentially.

I found the procedure facility disappointing for a couple of reasons. First, you are limited to 127 command lines containing no more than 124 characters each. More importantly, the lack of looping structures (such as DO WHILE, DO UNTIL or FOR NEXT) severely limits the possibilities for automating extensive applications. The procedure facility more closely approximates SUBMIT files than programming languages.

To be fair to Condor, the inherent power in some of its commands makes up for many of the deficiencies in the automated procedures. But it'd be nice to have a *little* more flexibility.

One feature which enhances the use of command procedures is the ease of setting up menu-driven applications (called 'help screens'). Figure 3 illustrates a menu for the contributors' payment system which took about three minutes to set up. The text in brackets refers to command procedures for performing various tasks, with the exception of 'HELP UPDATES' which brings up a second help screen with further options. Figure 4 shows how the menu will appear to a user. Using such help screens it is easy to provide users with a simple interface for performing many of Condor's functions.

Assorted Woes and Wonders

Where the package really falls down is in providing data manipulation functions. Databases like dBase, Optimum and KnowledgeMan have inbuilt functions such as conversion of lowercase letters to uppercase (and vice versa), substring extractions, numeric to character and character to numeric conversions, ASCII conversions and functions for removing trailing blanks from strings.

To illustrate the impact of such a lack: it is almost impossible to produce well formatted mailing labels (which must be one of the standard requirements of database packages) *despite* the excellence of Condor's Report Writer. The absence of a function to trim trailing blanks from strings results in labels which look like:

```
Jane                    Doe

121 Blue Jay Way

Cremorne                NSW
```

or (using the right justification feature)

```
                    Jane Doe

121 Blue Jay Way

                Cremorne NSW
```

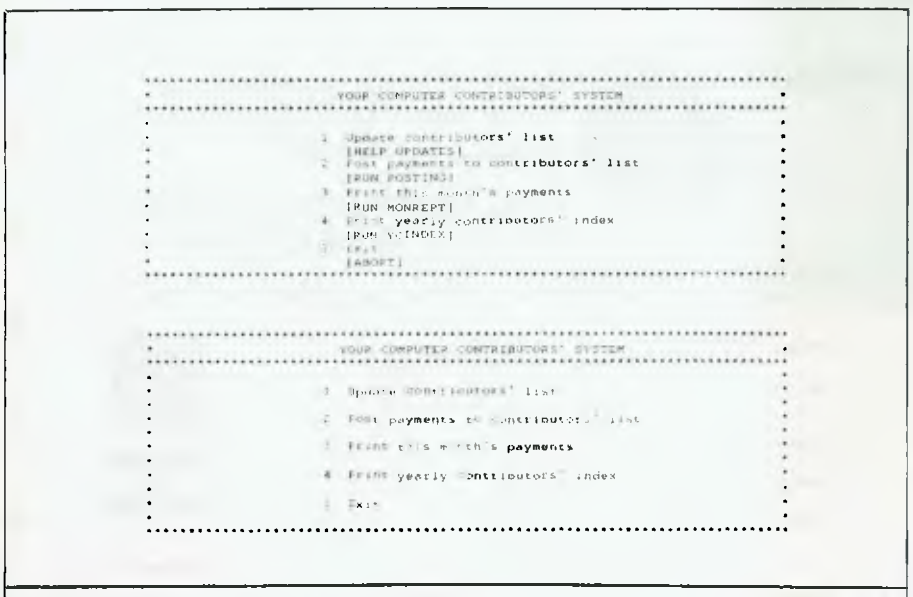
Frustrating, to say the least.

As recompense for the lack of functions, Condor's documentation is a treat. It consists of two manuals — a User's Guide and a Reference Guide. Both are clearly written and well-indexed. The User's Guide not only describes how to use Condor, but also provides an excellent summary of how to set up sound applications which satisfy auditing requirements. A few more examples of applications would not have gone astray, but that is a quibble rather than a complaint. The manual even gives extensive coverage to how to *recover* from the various catastrophes which may befall the intrepid database user.

The Bottom Line

The final analysis? I don't think Condor will win *The Great Database Search*; it's not a system which is the mostest. Of course, for people looking for a moderately powerful package to automate their small business's or organisation's records, it may prove to be just the ticket.

For someone who is fast becoming a database junkie, I know Condor is not the fix I'm looking for. Despite the power of the Report Writer and the POST command, the lack of real flexibility is the deciding point for me. □



Figures 3 and 4. *A menu for the contributors' system (top), showing command procedures in brackets; and (below), how the menu appears to users.*

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Public Domain Software for the IBM PC – GEMS OR JUNK?

Looking for a certain kind of utility? Need a cheap word processor? Maybe you wouldn't be seen dead actually buying a computer game, but you'd consider playing one now and again when the serious work is over? Most people aren't aware they can get swags of excellent software (and some that's not so good) for free. In this introductory article, John Hepworth makes the means of obtaining it public.

JUST WHAT IS public domain software? It is software written by users and shared with others around the world. Dig into the heap of goodies and you can find word processors, communications packages, spreadsheets, databases, DOS utility programs, Lotus 1-2-3 templates, games, graphics — it goes on and on.

Distributed through the user community, public domain software is usually free, but when a particularly good program is involved (such as PC-Talk III — one of the very best communications programs available anywhere) a donation will be requested, generally in the $5 to $100

In the public domain, just as in the commercial sector, there are great programs, good programs and indifferent ones. Outright bad programs tend not to gain distribution. Finding what you want is a little like mining for diamonds, sapphires or opals - you may have to dig up a lot of ore to get any gems, and the gems can vary enormously in value.

Public domain software may be trash for some, real treasure for others, but it's never, never pirate treasure! Bootleg copies of commercial software *don't* qualify. Piracy of this sort is actively and swiftly rooted out by all involved with distribution of real public domain software.

There are thousands and thousands of programs out there. I can guarantee some will solve problems for you that you have puzzled over for hours. But the list is growing every year, and the details in the listings are, of necessity, rather terse. Finding the one thing you need can be like searching for a particular grain of sand on a beach.

What's Available

Starting next month I'll be providing a monthly column examining various categories of software, and comparing the performance of different packages in each group.

The topics I'll cover include functional groupings such as:

- Communications packages
- Word processors
- Databases
- Spreadsheets
- DOS Utilities
- Games
- Graphics

This is not an exhaustive list, and as time goes on many other categories of software from the public domain will be covered.

This month I'll discuss the way programs are distributed, how the various files are connected with each other, and how documentation is obtained. Three programs absolutely essential for managing your public domain library are also explained.

The Authors

Public domain programs may be written by anyone, from raw beginners to professional programmers right at the top of the tree. For example, a little program called DOSEDIT is running on my machine right now, behind my word processing program. DOSEDIT was apparently written privately by someone at IBM's San Jose (California) facility, and from a bulletin board there it was subsequently distributed around the world.

Before we go any further I'll tell you a little about this program. When I am at DOS command level DOSEDIT stores my last couple of dozen command lines. I can recall any one of them at DOS level, edit it, add and delete characters, even from the middle of a line, and then re-use the command. When I exit my word processor, DOSEDIT is there, holding the last couple of dozen DOS command lines I used before entering the word processor. I load DOSEDIT via my AUTOEXEC.BAT file, and it is always present, waiting for me. Sure beats the F1, F2, F3, F4 and F5 keys which only recall the last command! I have shown DOSEDIT to a number of people — who all grabbed it immediately and now use it continuously, too.

Programs like these qualify as the blue-white diamond of the public domain gems — they run perfectly, they seem to have no hidden flaws, and once discovered you cannot live without them.

Just One Little Caution

Be warned — public domain has no warranties and no guarantees, and some programs can be bug-filled disaster areas.

How does one avoid these paste gems? I carefully test any routine before using it with critical data. If the system in use only has floppies, I make a test disk, putting on

it a copy of the program to be tested, and a few files copied from originals on a different disk.

After taking any other disk out of the machine, I now try the program, experimenting, exploring with confidence since no irreplacable data or program is at risk. If you have a hard disk, back up before trying out new software. (Not a bad idea for your first use of new commercial software, either.)

Where D'ya Get It?

Where do you get public domain software, what does it look like, and what do you do with it?

There are two main channels for distributing public domain software — user group libraries and the bulletin boards run by that dedicated (crazy?) band of public-spirited sysops.

At the end of this article I have included a list of a few user groups for IBM PCs, and the date and location of their meetings. Go along to a meeting, find the librarian, get a copy of the catalogue and place your order. If you come to the Sydney group, Tony Ward is the librarian. He and I are at most meetings, and would love to meet you and help you if we can.

The price for a disk of software is generally about $10, and most groups have access to over 100 different disks. To get disks you generally have to be a member of a group and place your order at a meeting.

Alternatively, log onto one of the bulletin boards and take a look around. The disadvantages of this method are that competition with other users to get onto most systems is enormous, and few boards can offer more than the equivalent of 25 disks of software at any one time.

Also, to download the equivalent of a disk of software takes over three hours, including very brief searches of the list of files available for downloading — I can't spare that much time, and in any case most boards will eject you much earlier.

What's in the Package?

Now what does public domain software include? And what does it look like?

For a start there are no glossy packages, no printed documentation and no warranties. A disk of software from your user group will have files relating to quite a number of programs on it. Included will be all the [illegible] files to make each program operate, and usually a file of documentation for each program.

File Types and File Groupings

Take a look at the directory listing below. I assembled it from assorted public domain goodies.

Directory File

A disk of public domain software usually has a directory file which contains some brief note on the content of each other file. The note for each file may only be ten or 20 characters long. This directory will be called something like CATALOG.xyz (where xyz is three numbers), READ-ME.DOC, or READ.ME, or it may even have just a .CAT extension.

Use the DOS command TYPE to see the directory file on screen, and the MORE filter if it is longer than one screen. (Key in the underlined parts of the following to read it a screen at a time.)

A> TYPE filename filetype|MORE

MORE.COM must be either in the default directory or accessible via a path.

Now for the arrangement of the files themselves.

Have you looked closely at the filenames in Listing 1? Do you see any pattern? Yes, you're quite right. In almost all cases the files are in groups of two or three, with the same file name and different extensions.

Now let's check out the various combinations. They fall into four groups: programs, source code, documentation and the exceptions which don't fit in the first three groups. ▷

```
Volume in drive A is UTILITY
-CATALOG xyz     nnnn  xx-yy-zz   x:yya
ALTER    COM     1024  10-19-84   8:11a
ALTER    DOC     4096  10-19-84   8:12a
FF       COM        8   2-19-85   8:34p
FF       TXT      249   2-19-85   8:50p
LAP      DOC     1792   2-03-84   3:01a
LAP      EXE    26112   2-03-84   3:07a
MAKEBAT  DOC     2048   1-20-85   9:34p
MAKEBAT  EXE     1536   1-20-85   9:36p
PC       EXE    30176   5-18-84  10:29a
PRINTER  COM     1152  12-30-83  12:15a
PRINTER  DAT      384  12-30-83  12:16a
PRINTER  [illegible]  [illegible]  [illegible]  12:18a
SQ       TXT    [illegible]  [illegible]  [illegible]  [illegible]
ST       COM    [illegible]  [illegible]  [illegible]  2:43a
SYMPHONY [illegible]  [illegible]  [illegible]  [illegible]  [illegible]:07p
TUNE     COM     [illegible]  1-01-80  12:00p
TUNE     DOC     [illegible]  1-01-80  12:00p
UPPER    ASM     [illegible]  1-08-84   4:32a
UPPER    COM      625  1-08-84   8:22a
UPPER    DOC      384  1-08-84   4:36a
USQ      EXE    27648  1-18-85   2:38p
WASH     COM     4608  1-16-85   3:00p
WASH     DOC    10752  1-18-85   2:14p
23 File(s)    135840 bytes free
```

Directory listing assembled from assorted public domain goodies

Programs

.COM and .EXE files are ready-to-run programs. Just type the filename at the DOS prompt, or call it up from a batch file, and it will load and run. Sometimes additional parameters will need to be specified, but the principle remains the same.

The extension .BAS may indicate a tokenised BASIC file, or a file in ASCII format. Most commonly, BASIC programs are distributed in ASCII format and given a .ASC extension, marking them as ready to load or (hopefully) compile. I usually think of files with a .BAS extension as programs and those with .ASC extension as source code.

If you get a tokenised .BAS file and can't load it, the most likely cause is that it was created on an IBM and you're trying to load it into a clone which uses different tokens when compressing a BASIC file.

To fix this little problem, find an IBM, start BASIC, load the program, and then save it using the syntax

SAVE "filename.filetype",A

Remember to use a different filename and/or filetype for the target file and source file, or the source file will be overwritten.

I have converted tokenised BASIC files to ASCII this way for a friend with a clone which uses different tokens in its version of BASIC from those used by IBM.

Documentation

Printed documentation does not exist for public domain programs. Look again at the list of files available. Most user groups include a file with a .DOC, .DOC or .TXT extension. These contain the documentation needed to utilise the program, and they can be enormous. One .DOC file I know of takes up over 120 Kbytes! Files with a .DOC extension are in a special, squeezed format and I'll talk about these again later.

Documentation files are often straight ASCII files with carriage returns at the end of each line and form feeds at the end of each page. To get a printed copy follow a procedure like that outlined below.

- Key in the underlined parts in the example. It is assumed the default drive is the A drive.

A>TYPE filename.filetype (don't press enter yet)

- Make sure your printer is ready. Press Ctrl and PrtSc at the same time, to cause all screen output to be echoed to the printer. Now press <enter>. The text of the documentation will scroll past on the screen and be printed on the printer.

- When text output ceases press Ctrl and PrtSc again to cancel the screen echo.

What — No Documentation?

But what's this? SQ.EXE, USQ.EXE, PC.EXE and ST.COM have no companion document file shown above. These are programs that have come to me through various paths, and while they may originally have had some documentation it's probably been separated in transit.

In such cases all you can do is make

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sure all your data and valuable programs are tucked away in a safe place, and then experiment with the program. I don't have a copy of documentation for any of these four, yet I've found them to be absolutely essential and keep them all on my hard disk!

Squeezing and Unsqueezing Files

Earlier I mentioned .DQC files. If you try to TYPE these they will appear as garbage. Such files have been very cleverly processed by SQ.EXE, to compress them. To be read they must be turned back into ASCII text files — USQ.EXE to the rescue!

Squeeze (SQ.EXE) and Unsqueeze (USQ.EXE) are a pigeon pair. *They are the first two programs to grab from the public domain*, because they allow you to recover squeezed documentation files for other programs. SQ.EXE makes two passes through a file, first to determine the frequency of appearance of each character, and then to create a new file compressed to around 75 per cent of the original file. USQ.EXE recreates the original file.

You may wonder at this practice of compression — what are a few kilobytes more or less on a disk? But with the original 160 Kbytes on a single-sided disk, compressing or not compressing could mean the difference between putting the whole of a program on a disk or spreading it over a number of disks. To put it another way, imagine downloading over a 300 baud line from a bulletin board; a 90 Kbyte file will take around 50 minutes, a 120 Kbyte file about 70 minutes. These file sizes are realistic. Just imagine how pleased a bulletin board sysop would be if all .DOC files were squeezed so hard disk space was freed for other programs.

Source Code

Most public domain programs are written in Assembler, though BASIC and Pascal are also represented. Often the author releases the source code along with the program and the documentation. Other users can then customise the routines, fix bugs, and contribute to on-going development. Traditionally, the following extensions are used for files containing source code:

.ASM Source code written in 8088 Assembler.
.PAS Pascal source code
.FOR FORTRAN source code
.ASC BASIC source code

In each case the file should be an ASCII file, ready to assemble or compile, and hopefully fully commented so it can be understood.

The Exceptions

The .LBR extension fits a most unusual file. Better considered as a library of files, it has been created by grouping together all the files associated with one program or topic. The sample shown, SYMPHONY.LBR, was a collection of hints and tips for Symphony on one of the bulletin boards.

But why group them? How were they grouped? And how can the various parts be separated?

We have already seen four program files above without any companion documentation. This may be no problem for some programs which respond well to trial and error, and where the user is well guided by error messages, but more complex programs have hidden features and hidden risks which require careful reading of documentation.

It is all too easy for the program file and the documentation to be separated; LAR.EXE provides a solution.

Let's imagine you have just written a magnificent program called PC-DEMO. It consists of DEMO1.COM, DEMO2.COM, DEMO.OVL, DEMO.MSG, AND DEMO.DOC. If you put it on a bulletin board and a user downloads only one, two or three files, how well would it work? Not at all. Wouldn't it be great to parcel all these files into one package, put it on the board and then allow the user to separate the different components on receipt?

LAR allows you to do just that. It takes all the specified files, creates a package of them under one file name, and includes a "directory" within the package. Such a package traditionally has a .LBR extension. On receipt of a .LBR file, the user browses the 'directory' with the aid of LAR, and then splits the file into its components, ready to run. LAR is the third essential public domain program.

Other Odd File Types

Other unexpected file types you might strike include .DAT or .DTA, which are data files needed for some programs, and .OBJ, which indicates an object file as created by some compilers. Some authors use file extensions to group the various parts of their program; one program called the Program Control System has varying file names for its ten or so files, but most have the extension .PCS.

Let's All Share Our Skills

Public domain software is great stuff, written as it is by enthusiasts willing to share their knowledge with people around the world. What do the authors get for all their efforts? Just a a warm feeling at their triumph over the silicon chip.

Using public domain software should be a reciprocal deal. I guarantee that for every masterpiece you write and release to the rest of the world, you'll draw a thousand more programs created by others from the pool. I hope you'll use the treasure waiting for you, and I'm waiting to see your offerings, too.

I'll be back next month with a look at some of the better public domain communications programs, so you can pick one to help you go snooping around the various bulletin boards (see the PAMs listing in this issue for board phone numbers and hours of operation). In the meantime, find copies of SQ.EXE, USQ.EXE, LAR.EXE and LAR.DOC; you'll need all four to make use of the gems we dig up. □

User Groups

Sydney PC User Group
Meets: On the third Monday of each month, at 5.30 pm, in the Price Waterhouse Seminar Room, 11th floor, AMP Centre, 50 Bridge Street, Sydney.

Melbourne PC User Group
Meets: On the third Wednesday of each month, at 5.30 pm, in Room 1, Clunies Ross House, 191 Royal Parade, Parkville.

Perth PC User Group
Meets: On the last Monday of the month at 5.30 pm. The venue varies. Contact the secretary, Peter Fry, on (09) 427 3733, for more information.

ACT PC User Group
Meets: On the fourth Monday of the month, at 8 pm, in the Main Lecture Room, Canberra TAFE, Reid.

IBM PC User Group
Meets; On the first Thursday of every month, at 7.30 pm. Meeting places vary. Contact the secretary, Don Richards, on (08) 261 9590, for more information. □

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...AND AND...WHAT'S THIS???!!!!!
PC DOS
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MY SUB-DIRECTED ASSASSINS*...
MATT WHELAN
TAKE HIM TO THE ERROR HANDLER!
BUTBUT BUT BUT BUT BUT BUT WHY..?.....
YOU!
YES ...ME...
...BECAUSE IT'S MORNING TEA TIME & WE NEED THE WORKBENCH FOR TABLE TENNIS.....
CAN WE DRTalk TO HIM, BOSS?
STATUS MESSAGE
HAS WHELAN JOINED THE PUBLIC SERVICE? HOW WILL BADLY BEHAVED PROGRAMS WORK CORRECTLY NOW? WILL BELL RING HIS ADJACENT POINTS OR TAKE APPROPRIATE ACTION?
*& YOU THOUGHT THIS WAS ALREADY ABSURD

PROGRAMMER'S WORKBENCH

This month Les Bell looks at new operating systems and operating system enhancements for the IBM PC.

Concurrent PC DOS

As you will no doubt have seen in last month's issue, Concurrent CP/M with windows was a runner-up in the Software Product of the Year Award. We regard (myself and the Software Product of the Year panel both) concurrency, or multitasking, to be a major breakthrough for the personal computer user. In fact, so strongly do I feel about it that three out of six computers here at PC Paradise have some kind of multi-tasking capability.

Cassius the Compupro, of course, has MP/M-816, which makes it not only multitasking but multi-user. Lisa, now downgraded to a Macintosh XL, can run multiple (in fact up to 22) programs at a time in separate windows. The latest to get this capability was Icarus, our IBM.

Now Concurrent CP/M may be all very well, I hear you say, but what software can you get for it? And indeed, that is the only problem with an otherwise excellent product — there's a definite shortage of software for it. CP/M-86 is, if not officially dead, pretty well in its last throes: can you get Lotus for it? dBase III? Framework? Symphony?

CP/M-86 may well be a thing of beauty and a joy forever, but if you can't run your software on it, it's not much flaming use. And Concurrent suffers from the same problem. It doesn't affect *me* much, because I'm quite well kitted out with the software I need, much of which I write myself, but it's been frustrating not being able to put it to full use.

This is all changed now, with the arrival of Concurrent PC DOS. I've alluded to it before in these pages, but never given a full run-down, mainly because I was waiting for my copy to arrive. Now it's here I can give a full description, together with some operating experiences.

It's a Big One

Concurrent PC DOS is a big system, in more ways than one. Firstly, the operating system itself occupies a lot of memory — well over 100 Kbytes, compared to DOS 3.0's 36 Kbytes. Still, in a 640 Kbyte PC, that's not a major problem. It's big in terms of disk size, too — five disks full. Of course, that's not all operating system; it includes utilities and help and document files.

It follows from this that Concurrent PC DOS must be a remarkably complete operating system, and this it certainly is. Apart from major applications, it is not necessary to buy any other software. Concurrent includes a mini-database, full-screen editor, communications utility, backup and restore utility and other useful programs.

Concurrent is initially booted from the first two floppies, and immediately bootstraps itself into its installation program. This is menu-driven, using the built-in menu driver, and offers the user the option of installing on floppies or hard disk. Frankly, though, a floppies-only Concurrent system is not going to be workable for someone with varied requirements, and a hard disk is much more satisfactory.

Installation consists basically of copying the master disks either to floppy or hard disk and renaming a few files so the next boot does not repeat the installation process. A hard disk should be partitioned about 25 per cent CP/M format and 75 per cent DOS format; Concurrent can use both.

While it is possible to make the boot sector of the hard disk load Concurrent directly, most users will probably want to leave PC DOS as the standard operating system, but place in their AUTOEXEC.BAT file the command LOADCCPM.ASK, which enquires of the user which operating system he or she wants. A negative response continues booting DOS, while an affirmative loads and runs Concurrent.

Once installed, Concurrent boots into File Manager, a menu-driven utility which splits the screen into green and blue panes (technically, they're parts of a window). This program is the outcome of development DRI did some years ago for Commodore on a Visual CCP, or menu-driven shell. It offers the user a list of commands in one pane, and a list of files to do them on in another, and by using the cursor keys, the user can select various operations without knowing any commands at all. (Makes note to self: must research use of this with a mouse...)

Of course, when confronted with such a simple user interface, I completely ignored the manual, and it was only later, while trying to do some more advanced things with it, that I discovered File Manager is much more advanced than I thought, with the ability to tag multiple files for transfer and generally providing a superset of the capabilities of programs like WASH and SWEEP.

File Manager illustrates one immediate benefit of concurrency: although the user can select options like 'Format Diskettes', for example, FM does not have that capability built in. Instead, it simply loads the DSKMAINT (Disk Maintenance) utility and goes straight to the Disk Formatting main menu. Once formatting is complete, control returns to File Manager.

However, the experienced user will probably want to bypass File Manager and use the system directly from the prompt. In this mode, Concurrent combines features of both Concurrent CP/M and PC DOS. Both PIP and COPY are provided for file copying, for example, and disks can be split into either user areas (*a la* CP/M) or sub-directories (*a la* PC DOS) using the MKDIR, CHDIR and RMDIR commands.

Like Concurrent CP/M, Concurrent PC DOS allows the user to run up to four (or in fact more) programs at a time. Switching between programs is done by using ▷

the control key with the 1, 2, 3 and 4 keys on the numeric pad. Damn: Concurrent CP/M uses 0, 1, 2 and 3! If the user wishes, however, the window-switching keys can be redefined.

The names of the running programs appear across the bottom status line, with the current window name in reverse video. Also displayed are the current printer number, drives with open files, other status messages and the current time. All in all, the status line is very informative and well managed.

Applications Included

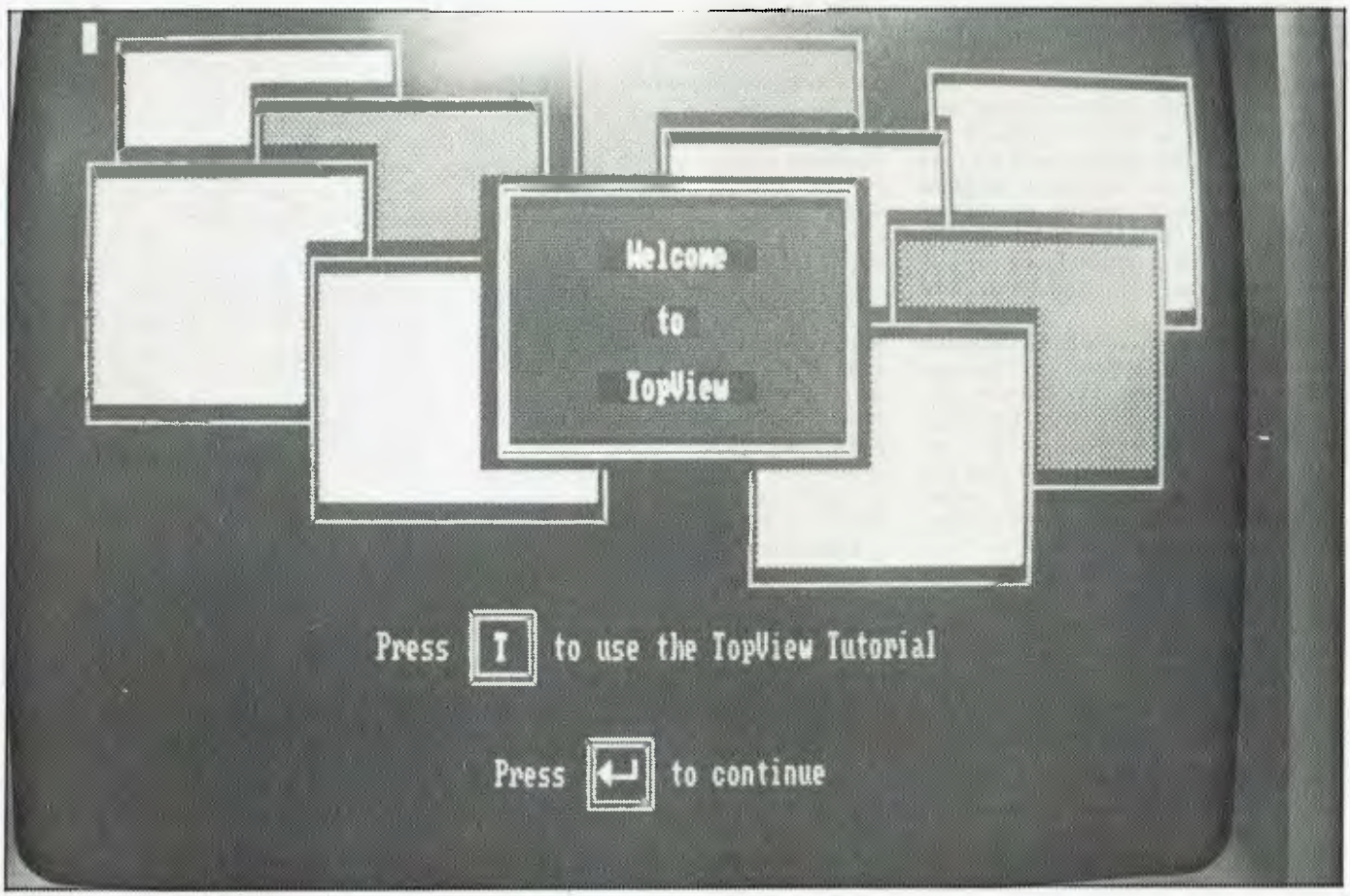
Concurrent is supplied with some basic applications programs, as outlined above. Perhaps the most important of these is DRTalk, which is actually the well-known public domain program PC Talk III. Hopefully DRI is paying a decent royalty for this; I expect so, since it's a pretty straight company. DRTalk can be used for general asynchronous communications, including file transfer with other systems, and works like a charm with the DataNet-Comm In/Modem, including auto-dial facilities.

Frankly, a floppies-only Concurrent system is not going to be workable for someone with varied requirements, and a hard disk is much more satisfactory.

For editing of both programs and documents, Concurrent is supplied with DR Edix, which is of course another program previously available separately. DR Edix is a very powerful editor indeed, and is in a completely different league from ED and EDLIN (does anybody actually use those?). It is able to edit two files simultaneously in two panes (not windows!), and can manage multiple buffers and do other nice tricks. With this program, plus a public domain print formatter, you need never buy a word processor!

The Personal Cardfile database is extremely simple, but quite useful — certainly worthwhile for the price, which is more or less free. It basically emulates a Rolodex card file, and while such programs have been of limited success on personal computers to date, this is simply because of the time involved in loading them and their files. With Concurrent PC DOS, the program can simply be started and left running all day, providing instant access by switching windows.

Concurrent also comes with a menu utility which allows the user to set up menus for running programs, including help screens and all kinds of goodies. I haven't played with this, but it looks useful for generating completely turnkey systems. ▷



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Other programs supplied as part of Concurrent are basically utilities, although some of them are very important. BACKREST, for example, is a backup and restore utility which enables automatic backup of hard disks. Most of the Concurrent utilities are menu-driven and make extensive use of the programmable function keys. Even for a non-technical user, they make the PC a much more versatile piece of equipment.

For example, the SETUP utility allows complete control of the RS232C port(s) on the PC, including baud rate, parity and so on. This even extends to control over whether RTS, CTS and the other handshaking signals are required, a facility which ordinary DOS only supplies under BASIC. Being menu-driven, this utility is much easier to use than DOS's MODE command. But once the correct configuration has been found for some application, it can be either preset in the BIOS, or given in a command line or BATCH file, just like DOS.

Another useful facility is the WMENU command. Once this has been run, the user can at any time invoke a menu on the 25th (status) line, which allows him/her to reduce the size of windows, move them around, change their colours, and so on. This is probably the most spectacular part of Concurrent DOS operation. One interesting capability is writing the contents of a window to a text file — the nearest raw Concurrent gets to a 'cut and paste' capability.

Regular DOS users will be aware of the way screen scrolling causes the top of the screen to flicker irritatingly. Under Concurrent DOS, the user can select to have fast, but flickering, scrolling, or slow and smooth scrolling. Nice touch ...

Other capabilities include the ability to connect external terminals to the serial ports, making the PC a multi-user system. This works well; we tried it to make sure, and had no problem. It is much more satisfactory than the DOS CTTY command, as three users can use the system simultaneously. A built-in memory disk drive speeds operation significantly, and another option allows the disk drive head step time to be tweaked for optimum or quietest operation.

Regular DOS users will be aware of the way screen scrolling causes the top of the screen to flicker irritatingly. Under Concurrent DOS, the user can select to have fast, but flickering, scrolling, or slow and smooth scrolling. Nice touch — and the difference in speed is not really noticeable.

Other commands are used to set up the ▷

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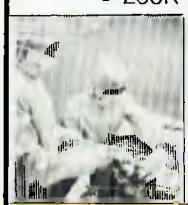

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memory allocation of the system before loading DOS programs, as these tend to be badly behaved — see below. These commands can be a bit tricky, but can be incorporated in batch files to simplify operation.

The documentation for Concurrent is much better than earlier DRI efforts. It even includes colour illustrations, which is something I would never have forecast. All the major programs like DRTalk and DR Edix have a chapter to themselves, plus an introductory overview and a chapter covering all the commands. It is quite readable, although an operating system of this size and sophistication could still use more. While the Concurrent manual is much thicker than the DOS manual, and is less terse, some vital information, such as the instructions for BACKREST, has been supplied as either printable or on-screen help files. In most cases, the help utility can supply enough information to get around problems.

Where It Scores

Concurrent DOS scores in a couple of ways over earlier operating systems. First, it is much more versatile, and its menu-driven utilities mean everyone can have access to that power. Second, its multi-tasking capability improves productivity. Let me illustrate.

Recently, I was in Perth giving a seminar on MS-DOS and PC DOS, and naturally I had a copy of Concurrent PC DOS with me, as well as a copy of TopView. Also in town was Dr Robert Graham, fellow PC of the Year panellist and lecturer, giving a seminar on spreadsheets. Of course, we just had to get together to compare notes.

After playing around with TopView, we turned our attention to Concurrent PC DOS. Robert was most interested to see how Concurrent handled spreadsheet applications, and I must admit I was curious, as not being a Lotus user I had not yet tried the two together.

We started by loading Lotus 1-2-3. It signed on in the usual way and operated with no observable differences from the usual DOS operation. Next we wanted to see if Multiplan would run — so we swapped to the next window and loaded and ran Multiplan. Again no problems. Robert was enthusiastic already — he could see himself doing comparisons while running both spreadsheets at the same time!

Imagine running Lotus 1-2-3, Multimate and dBase II at the same time, and still having a free window to perform other tasks ...

So we decided to push it further, and loaded up DR Edix and started editing two files simultaneously, and then ran the HELP program in the fourth window. That meant we were running two spreadsheets, editing two files, and getting further information about other possibilities — all at the same time! I was quite impressed myself.

By setting the SUSPEND option of Concurrent off, we were able to do the above while Multiplan continued running an iterative loop in the background. Very nice. But there was some interference between Multiplan and other programs, as expected, so it's probably better to run such programs with SUSPEND on.

Clearly, there's a productivity pay-off here. Imagine running Lotus 1-2-3, Multimate and dBase II at the same time, and still having a free window to perform other tasks.

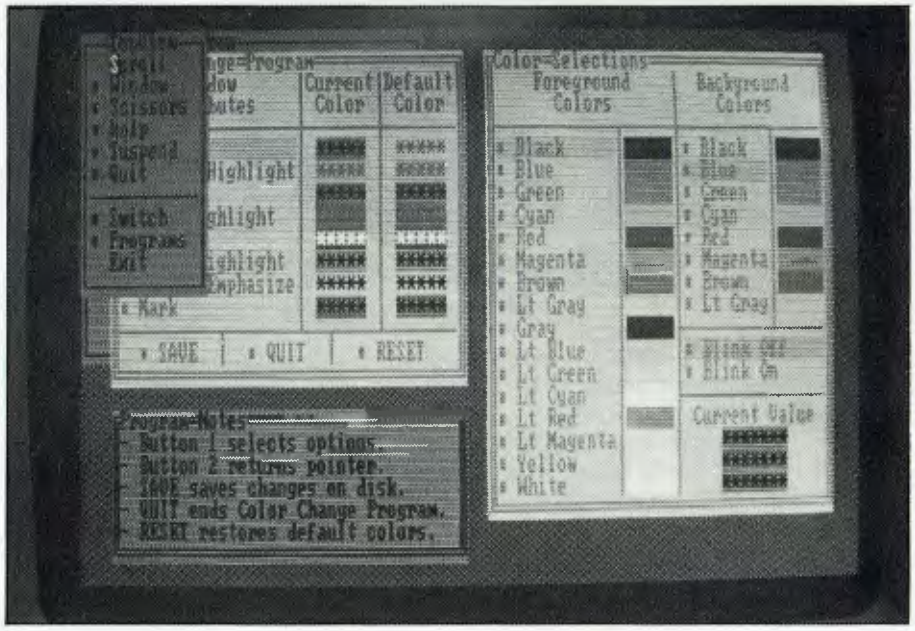
Of course, Concurrent does have its drawbacks. One is its sheer size, which reduces the amount of memory available for spreadsheets. Another is the slight trickiness of setting up memory allocations for DOS programs (CP/M programs do it automatically), which means some non-technical users might have to seek help from support staff. Thirdly, there's the price: $US295 will deter some potential users, although it really is remarkable value.

Will Concurrent succeed in the marketplace? I hope so. It makes the PC a much more usable machine and increases its functionality and power without getting in the user's way. In many aspects, it is easier to use than ordinary DOS. However, IBM's TopView offers some similar facilities with superior marketing power. Of the two, my preference — and that of most users who have tried both — is for Concurrent, but TopView could interfere with the success of Concurrent. In any case, I'll keep using it; if others choose not to, that's their loss.

View from the Top

I recently had the opportunity to take a look at TopView, IBM's new operating system extension for the IBM PC family. It's an interesting product, particularly in view of the fact that it is an IBM product and will figure largely in IBM's plans for the PC.

TopView adds a number of capabilities to DOS 2.1 or DOS 3.0, under which it



runs. First, it adds multi-tasking; that is, the ability to run multiple programs at one time. This is done without modifying the operating system in any way, so it's fairly primitive but adequate for most PC users.

Second, it adds windowing capability, and enables several programs' screen output to be displayed on the screen at one time. This is further extended by the ability to cut and paste between windows.

When first invoked, TopView displays a large IBM logo, and then puts up its entry screen, which offers the user the opportunity to enter the TopView tutorial or to proceed straight into using the package. The tutorial is actually an emulation of TopView, rather than the real thing, but it does give the user the feel of the package and builds confidence.

TopView can be either mouse-driven or driven from the keyboard. Whichever method is chosen, and whichever mouse is selected, TopView refers to three buttons. For the keyboard, these are the Alt key and the numeric keypad's 7 and 9 keys, while with a two-button mouse, such as Microsoft's, they correspond to both buttons together, the left and the right buttons respectively.

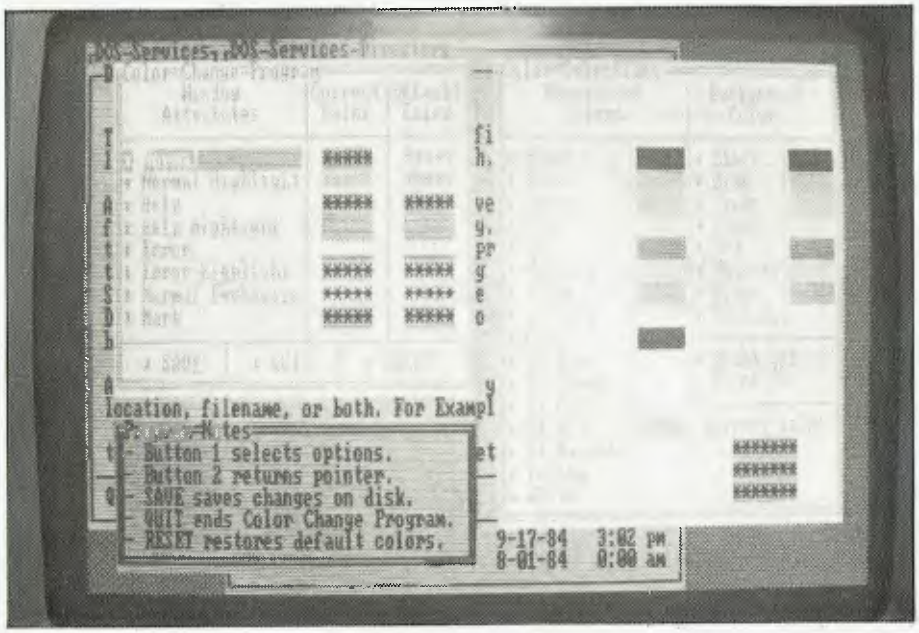
Even when mouse-driven, the TopView cursor is nothing glamorous like an arrow pointer, I-beam or hourglass. It's simply a rectangular blob, such as you see when using much more mundane packages.

The first menu TopView displays is the 'Run-a-Program' menu, which lists the applications installed under TopView and which can be run. Available options, which at this stage are all options, have a small square in front of them. Later, if they become unavailable, the square will disappear.

Topview's main menu offers a number of interesting options, such as 'Scissors'. This allows the user to cut an area of text out of a window and paste it into another application.

Typical options on this menu include the calculator, alarm clock, colour change program, DOS services menu and other programs.

Selecting the calculator, for example, brings that 'desktop accessory' onto the screen in three windows: one for the calculator itself, one for its memory and one for its tape. This runs contrary to the common sense (and experimentally borne out) rule that one application should occupy one window; but it seems to work all right despite the possibility of confusion.



The DOS services menu displays a couple of windows, of which the largest contains a sorted directory. Another menu in a window allows sorting by name, type, date or size, while the main menu allows copying, viewing and other file-related activities. The user can specify a sub-directory before making a choice.

Under the 'other' menu choice, the user is prompted to enter any DOS command, yet TopView appears not to know about the DOS built-in commands like DIR, for example. If I gave DIR as a command, TopView prompted me to insert my 'DOS DIR' program diskette, rather than simply doing what was asked of it.

The TopView main menu is accessed by pressing button three (both mouse buttons together or the Alt key). It seems strange that this menu should simply pop up on the desktop, rather than being permanently visible as a menu bar. Perhaps IBM wanted to keep well clear of Apple's patent rights on the pull-down menu blind, or perhaps they simply wanted to keep clear of applications which use the top line of the display; whichever, the operation is quite different.

The main menu offers a number of interesting options, such as 'Scissors'. This allows the user to cut an area of text out of a window and paste it into another application, presumably as a series of keystrokes in the first instance. The 'Switch' option brings up a sub-menu listing those applications currently on the desktop and allows the user to make one of them the current foreground task.

The 'windows' menu allows the user to resize and move windows on the desktop.

All this menu selection can get a bit tedious; task switching is much faster in both Concurrent PC DOS and the Lisa, for example. TopView is not terribly fast in general, although it performs some tasks, such as moving windows on the screen, much faster than Concurrent PC DOS.

The impression one is left with is that the programmers who wrote TopView did not fully exploit the capabilities of the PC hardware. This could be because they were not experienced PC system programmers, or more likely because they sacrificed some performance to portability of code — not just across the PC family, but also to IBM mainframes. The intention is that TopView should run on a wide variety of hardware, including 3278/9 terminals and the like.

This means TopView is less responsive ▷

than one might like and a little more awkward to use than other similar products. Nonetheless, it will probably sell like hot cakes.

Bad Behaviour

Both TopView and Concurrent PC DOS suffer some common problems. Size is one: each occupies vast amounts of memory, and while 640 Kbytes might sound like a lot (particularly if you currently have a 48 Kbyte CP/M system!) it will not take much to fill it up, particularly if large spreadsheets are involved.

More importantly, both systems have difficulty managing the memory available to DOS applications. DOS has only primitive memory management functions, and most DOS programs do not even use these. Typically, a DOS program loads into memory and simply expects to be able to use all of memory. This means programs may not subsequently be able to load, since no memory is available, or that programs may overwrite each other.

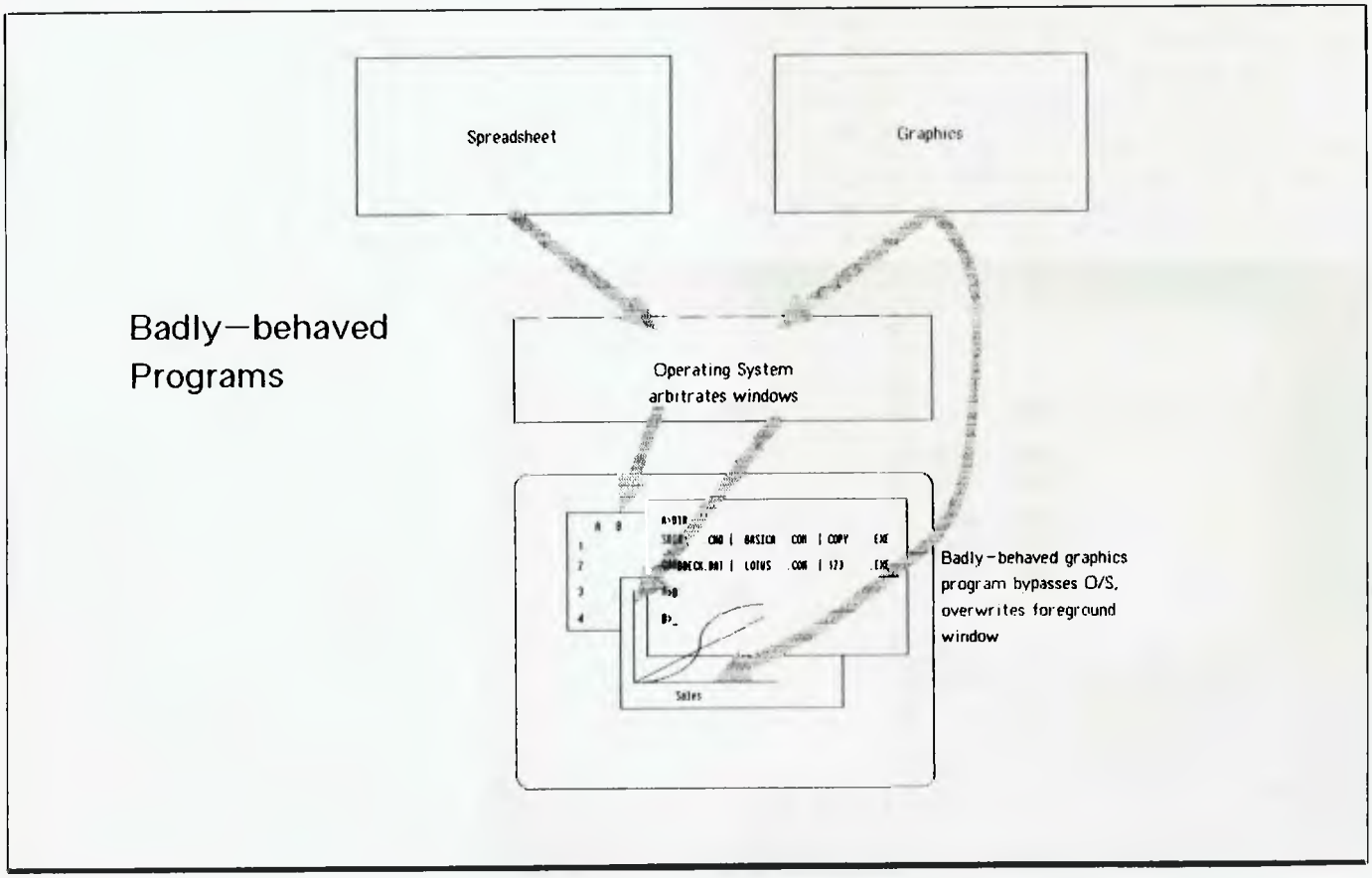
Most important of all, some programs are badly behaved, in that they do for themselves tasks which the operating system should do for them. The most typical example of this is screen output. While programs should request that the operating system put a character on the screen for them, many simply write the character directly into the video memory, in order to achieve speed.

Both TopView and Concurrent PC DOS suffer some common problems. Size is one ... More importantly, both systems have difficulty managing the memory available to DOS applications ... Most important of all, some programs are badly behaved.

To see the difference, try running both the CP/M version of WordStar and the DOS version on the same PC. The CP/M version outputs characters via CP/M's built-in IBM 3101 emulator, while the DOS version writes directly to the screen, making it significantly faster.

But now try running these two programs under Concurrent DOS and see the difference. Since the DOS version of Wordstar bypasses the operating system, Concurrent DOS cannot adequately manage the screen windows, and the DOS WordStar is liable to completely overwrite another application's window. The CP/M version, however, is well-behaved, if slow.

The same observation applies to TopView, although comparisons are not so easily made. TopView is more explicit in the attempts it makes to control programs, to the extent of swapping the ▷



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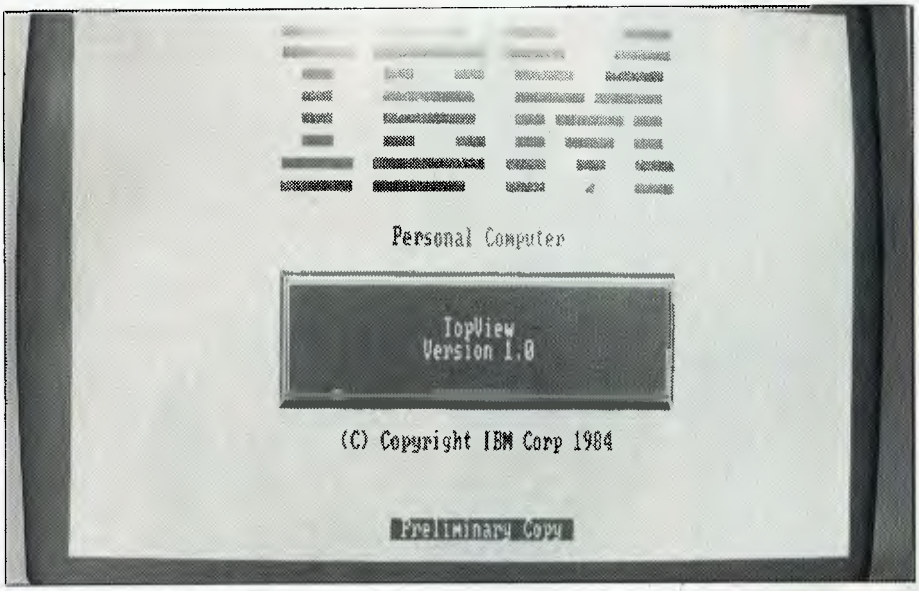

Important Addendum

Profuse apologies to all concerned, but a couple of bugs crept into last month's structure editor program (SE.PLI). If you intend to use it, please make the following changes to the program:
Page 80, among the declarations:

```
dcl datafile char (8) varying;
```

should be

```
dcl datafile char (10) varying;
```

as otherwise there is no room in the string for a drive name.
Page 80, bottom line and page 82, in procedure open:

```
open file (database) record keyed direct
update title (datafile||'.DBF');
```

should be

```
open file (database) record keyed direct
update env(f(520)) title (datafile||'.DBF');
```

Please update the version number to 1.01 to reflect these changes.

Terribly sorry and all that, won't let it happen again, promise I'll do better in future, bow, scrape ...

interrupt vectors which are interfered with by different programs. Attributes like the range of interrupts to be swapped are visible in the TopView program installation dialogue. Concurrent DOS presumably does this also, although it is not visible to the user.

Because of such difficulties, these extended operating systems are not as attractive as they will be on the next generation of hardware. First, we need more memory — 640 Kbytes is no longer enough, and the AT's architecture does nothing to help in this regard.

However, the kind of facility provided by Concurrent DOS-286 will solve many of the problems. This operating system takes advantage of some of the features of the 80286 processor chip; for one thing, the 80286 is so much faster that a lot of the operating system overhead caused by well-behaved programs (like the CP/M WordStar) will disappear, so software developers will no longer be able to use that as an excuse for their badly behaved programs.

Most importantly, the 80286 has advanced memory protection features. For example, an area of memory corresponding to the IBM PC screen could be made execute-only. That is, it can be neither read from, nor written to, by an application program. Only the operating system is privileged to do these functions.

Now, when a badly behaved application — say a graphics package — tries to write to the screen, the 80286 hardware detects this, and traps it, causing an interrupt to an error handler. The error handler, which is part of Concurrent DOS-286, can detect that this is a badly written PC DOS program trying to write to the screen of a PC. It can also work out what it is trying to write, and where.

The operating system can then decide whether what is being written should appear on the screen, or whether it is in a hidden window, and take the appropriate action. It could even do more. If it decides the program just tried to write to two adjacent points on the IBM PC graphics screen, it could even draw a line between the corresponding points on a (real) higher-resolution screen.

So by taking advantage of these next-generation features, operating systems like Concurrent PC DOS and TopView can force badly behaved programs to work correctly, and can provide even higher levels of performance. Soon, please ... □

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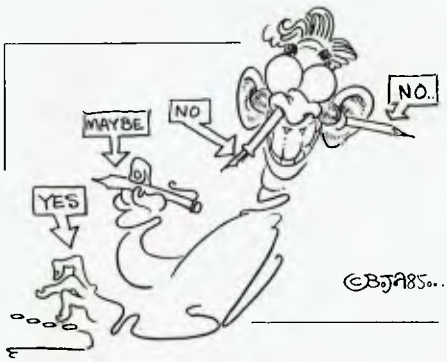
Instruction Set

Structured Programming.....149

The good Doctor Phil started his series last month by defining the discipline of structured programming — this time he delves a little deeper, and draws some more of those helpful diagrams . . .

By Phil Grouse



How to Write for Your Computer.....155

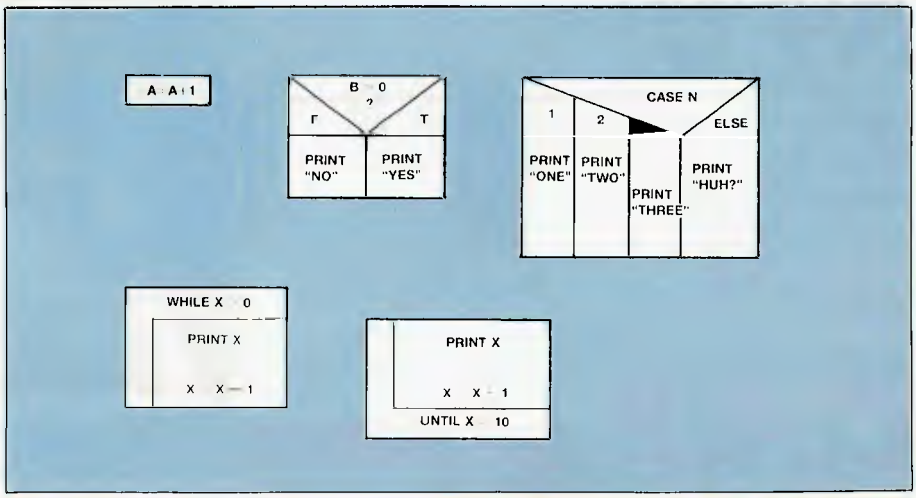
We sometimes pay good money for contributions; we always want good contributions for our money. To save you taking chances, here's a rundown on what we want from you, and what you'll get from us.

By Natalie Filatoff

dLast of dBase 163

dLast? How could he? We thought Bell could write forever on a subject that's dear to his heart. Nevertheless, fearless Les insists the dBest of dBase series is drawing to a close — he's already started work on his next tutorial. What is it? You'll have to wait and see ...

By Les Bell



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HOW TO WRITE A STRUCTURED PROGRAM - Part 2

Following last month's introductory tutorial in which he defined structured programming as a discipline that leads to 'good' programming, in this issue Phil Grouse delves a little deeper, and draws more diagrams.

IN PART I of this series we decided structured programming involves voluntarily restricting one's control structures to a 'preferred set', and the avoidance of global variables.

We also mentioned that not all languages are designed for structured programming, since they do not include all the 'preferred set' or support 'local variables'. BASIC is a case in point.

Nevertheless, one can still write structured code by creating a structured 'program logic specification', which is then translated into the chosen target language. Our first article introduced the ideas of Bohm and Jacopini (1966), which showed how flowchart specifications could be tamed by limiting the control constructs to WHILE, UNTIL, IF-THEN, IF-THEN-ELSE, and CASE. Each construct involved a specific flowchart configuration with a single entry point and a single exit point. These voluntary restrictions had the benefit of enabling the programmer to verify the logic in an orderly way. (Consult Figures 2 to 7 of the previous article).

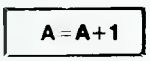
The fact is most programmers are pretty self-opinionated. It's fairly true to say that to be a good programmer, you have to be a smart cookie (even if you're lousy at maths). Consequently, there is always the temptation to use your programs as a means to show off. In a commercial environment this is a sure ticket to disaster. Programs with tortuous and devious logic may impress the less knowledgeable for a while, but they will eventually result in others using the programmer's name as an execration. Pity the poor maintenance programmer who has the unenviable task of making a few minor modifications to the logic, if that logic is crammed with obfuscation!

Not only that, how about the problem of checking your logic before blundering it into source code? It's a very wise move to desk-check a program's logic before the coding stage. Desk-checking a correctly structured program becomes a relatively straightforward proposition, and later in this series we'll show how to do just that.

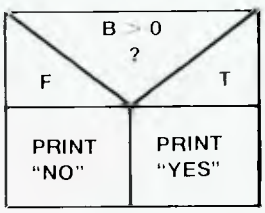
Flowcharts have been the standard means for representing program logic for many years now, but they suffer from a number of drawbacks. In particular, because they are linked to funny-shaped boxes and connecting lines, they do not take kindly to representation on the normal non-graphics display screen or a regular printer. While programs exist for translating programs back into printed flowcharts, the end result usually is of academic interest only.

What is needed is a form of flowchart which recognises the existence of the formal control constructs, the one-entry-point and one-exit-point concept, and the need to be able to represent it cleanly on your display screen. ▷

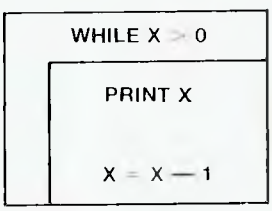
Figure 1. *Some representative Nassi-Shneiderman diagrams.*



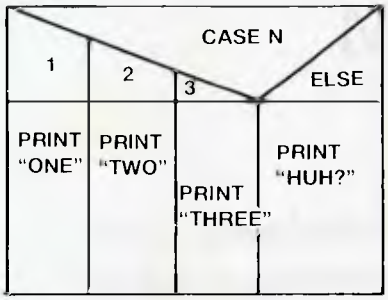
a. *Simple sequential operation.*



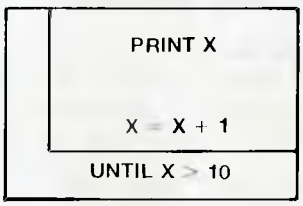
b. *The* IF-THEN-ELSE *selection operation. If the condition is true, the sequential block on the right is executed.*



c. *The* CASE *selection operation. Depending on the value of* N, *you execute the block in the appropriate column. If there is no corresponding column, you execute the 'default' block on the right.*

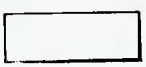


d. *The* WHILE *block contains a single inner 'controlled' block. The condition is re-evaluated and tested just before executing the controlled block. When the test is false, the controlled block is skipped, and the* WHILE *block terminates.*

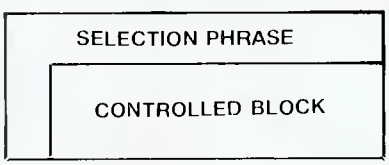


e. *The* UNTIL *block is similar to the* WHILE, *except the test is performed after the controlled block. This is emphasised here by writing the control phrase under the controlled block.*

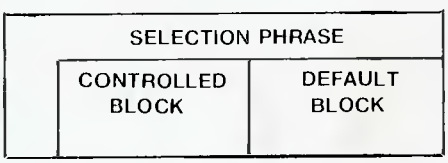
Figure 2. *The basic flowblock shapes.*



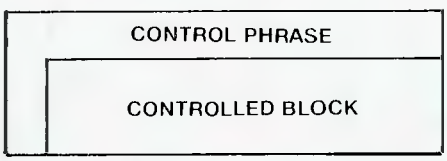
a. *Simple sequence operation block.*



b. *A selection operation in which no (default) action is to be taken if the selection phrase cannot be satisfied.*



c. *A selection operation with an explicit default operation. The block on the right is performed only if the selection phrase is unsatisfied, otherwise the block on the left is selected.*



d. *A repetitive block. The inner controlled block is executed according to the control phrase above it. This is usually a* WHILE *or* UNTIL, *although others (such as* FOR*) may also be used.*

Nassi-Shneiderman Diagrams

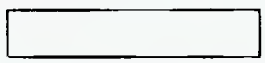
A major step forward in this direction was made in 1973 by two authors, I. Nassi and B. Shneiderman, in a short, informal contribution to SIGPLAN Notices. They proposed that each control construct should be represented by a simple rectangle, the contents of which specified the nature of the control. Each rectangle is assumed to have a single entry point (the top) and a single exit (the bottom). If you cover up the contents of the rectangle so as to ignore its internal constructs, the rectangle (or block, or box) is logically equivalent to a sequential operation. Figure 1 illustrates some sample Nassi-Shneiderman (NS) diagrams. You will see how each control construct has its own particular internal 'shape'.

NS diagrams have been accepted as the norm by many individual programmers and software houses. But while they meet the requirements of structured programming, they are still decidedly awkward to depict as hard copy, or on the screen. The problem is those sloping lines. Unless your computer is running in a graphics mode, this can look very messy. As such, NS diagrams are usually to be found only in a program's external documentation as hand-drawn figures.

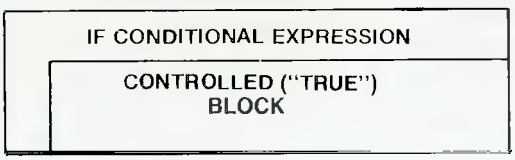
Another problem rests with the NS choice of representing a CASE block. You must provide a column (long thin block) for each case of the controlling expression. Fine if there are less than five cases to handle, but murder if there are more.

As will no doubt become increasingly obvious during this series, improving the NS diagram system has been a primary concern of mine for many years. It can be done. The revised system is called 'flowblock notation'. I will leave it to you, dear reader, to decide whether it is a better alternative or otherwise. We will be using flowblock notation for the remainder of this series! ▷

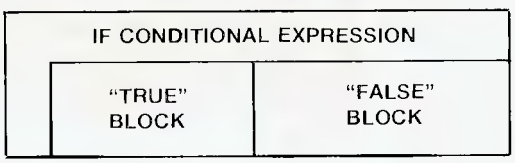
Figure 3. *The preferred control constructs as flowblocks.*



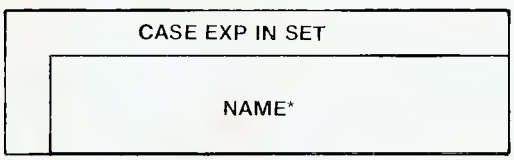
a. *Simple sequence (no change here).*



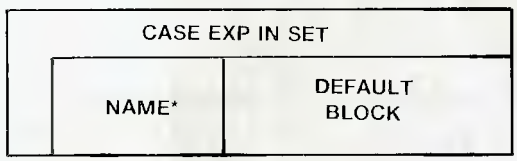
b. *The* IF-THEN *operation. The controlled block is performed only if the condition is true, hence it is sometimes called the 'true' block.*



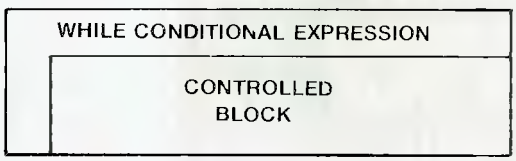
c. *The* IF-THEN-ELSE *operation. The left controlled block is performed if the condition is true, otherwise the right block is performed. Note this means their execution is mutually exclusive.*



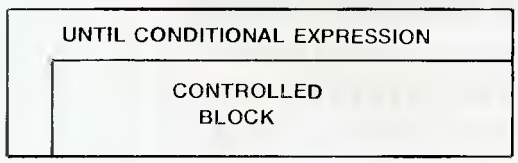
d. *The* CASE *operation (without a default block). Here, the expression 'exp' is evaluated as a simple number or string. If the result is found within the 'set', then an appropriate block is performed. The name of that 'appropriate block' is formed by replacing the asterisk after 'name' with the number or string. This means there is no practical limit to the number of cases one can represent. If the expression is not found in the 'set', nothing happens.*



e. *The* CASE *block with an explicit default operation. If the value of the expression 'exp' is not found in the 'set', the default block is executed.*



f. *The* WHILE *block. The keyword* WHILE *is followed by a conditional expression which is tested for 'truth' at the start of each new cycle. Thus when the loop terminates we know the condition is 'false'.*



g. *The* UNTIL *block. We now use the keyword* UNTIL *with a conditional expression to indicate that the test is to be performed after each pass through the loop.*

Flowblock Notation

NS diagrams provide a particular geometric 'shape' for each conceivable control construct. There are, however, only three distinct classes of control construct. They are 'sequence', 'selection' and 'repetition'. Accordingly, there are just three geometric flowblock forms — one for each class of construct. This therefore simplifies the task of selecting suitable geometric forms of representation. Furthermore, we can now make use of the fact that a majority of VDU screens can display so-called 'box' drawing characters such as vertical and horizontal lines, and the various corner pieces. The IBM PC is a case in point. All the flowblock control shapes are capable of display on the PC, as well as a bundle of clones, and not-so-clones. Even if your machine is not in this class, you can still use members of the regular ASCII character set as a reasonable approximation.

Figure 2 shows the three basic flowblock 'shapes'. By varying the control phrases in the selection and repetition forms, one can create the whole gamut of control constructs without resorting to strange graphical representations.

Figure 3 puts some flesh on these shapes, resulting in the familiar set of preferred control constructs. The 'sequential' operation, in Figure 3a, is discussed below, while the operations from 3b to 3f are explained under the diagrams.

The sequential operation is the same as its NS and flowchart equivalent. It may represent anything from a simple operation to a complete program, or a subroutine. If it represents the complete program, the practice is to write the name of the program just outside the block at the top.

Figure 4 is a representation of a program called 'Printer', which simply lists a file. (Remember — we tried this last time with flowcharts.) The program consists of three separate sequential blocks which correspond to three other named sequential operations: Prologue, Process, and Epilogue. We have determined to 'defer' the problems of design to three simpler operations. All Figure 4 shows now is the order in which these three modules will be performed. We should also have a pretty good idea of what those modules need to do. The modules 'Prologue' and so on are said to be 'at the next level of abstraction'. They can be designed at a later stage, provided we know what they have to do (although we may not now know *how* they will do it).

Figure 4 is therefore the representation of the 'main program' or 'mainline'.

In our next article in this series we'll complete this simple program as a set of formal flowblocks. This will illustrate most of the constructs depicted in Figure 3. Till then, good programming!

References

- C. Bohm & G. Jacopini, 'Flow Diagrams, Turing Machines and Languages with only Two Formation Rules', *Communications of the* ACM, Vol. 9, No. 5, May 1966, pp. 366-71.
- I. Nassi & B. Shneiderman, 'Flowchart Techniques for Structured Programming', ACM SIGPLAN *Notices*, Vol 8, No. 8, August 1973, p. 12.
- P.J. Grouse, 'FlowBlocks — A Technique for Structured Programming', ACM SIGPLAN *Notices*, Vol 13, No. 2, Feb. 1978.

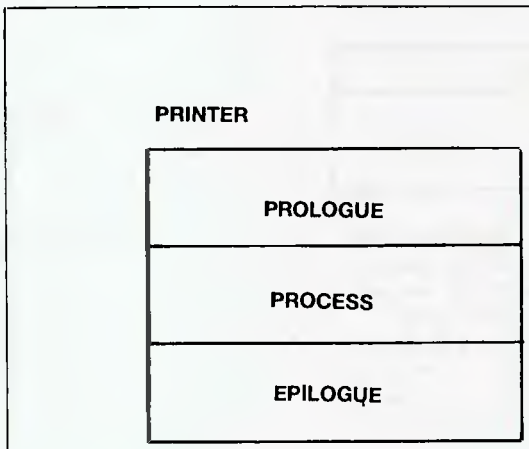


Figure 4. *The 'mainline' for a file listing program drawn as a flowblock. The three components refer to other (yet to be provided) named flowblocks.*

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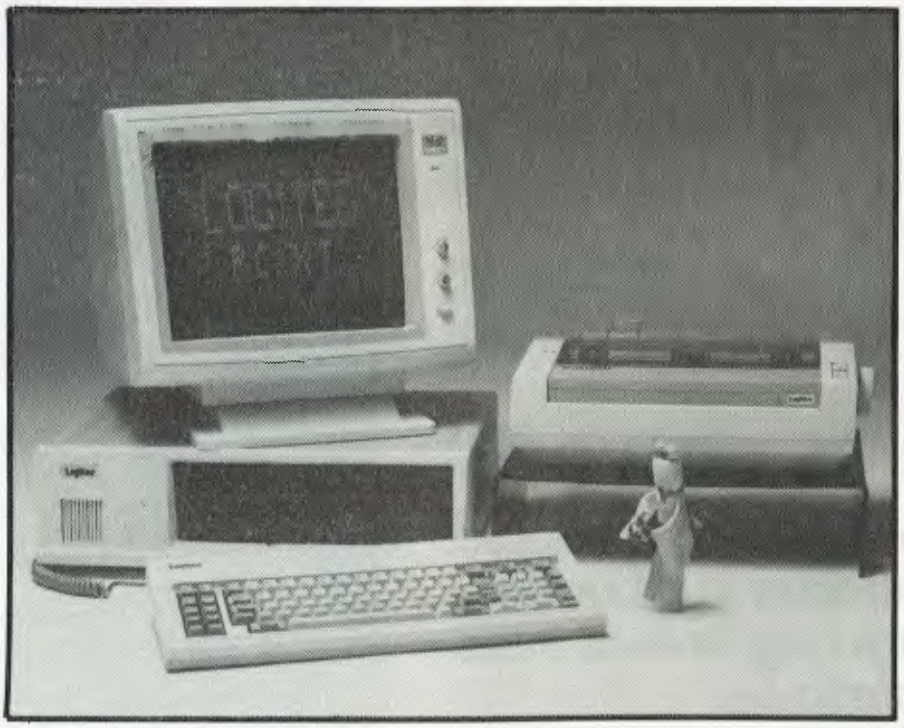

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HOW TO WRITE FOR your computer

We weren't too sure about publishing an article encouraging you to write for us — we're still trying to surface from the pile of contributions which flooded us the last time we did so, more than two years ago. However, we thought it only fair (to both of us) to let you know exactly what we want, when we want it, how we want it, how much of it we want, and how much we'll pay you for it ...

"TAP. TAP. Tap-tap-tap. Rata tata tatatatata tat," go the keys. The neighbourhood is dark, bar the flourescent rods which illuminate patches of suburban bitumen, and one tiny attic square of light within which a silhouette figure is hunched, fingers dancing madly as if playing a compact piano. Inside, the room is smoky, ashtrays overflow, screwed-up balls of paper litter the floor and several unfinished cups of coffee play host to microscopic bacteria which will eventually grow into ... mould.

So, you want to be a *Your Computer* journalist! Many's the time you must have pictured yourself in the above scenario, churning out words of wit, wisdom and wonder. But, alas, you found your attempts at growing a Les Bell moustache failed (especially hard for women), smoking makes you gag, you know you couldn't operate one of those old manual typewriters without the help of a sledge hammer, and you can only stand caffeine when it's a mere flavour in a carton of Moove.

Hmmm. We can imagine you sitting there, thinking of all the useful, sometimes objective, sometimes clearly personal, concise, instructive, informative, intelligent, exciting things you could tell our readers, your hands ranging listlessly over the keys of your personal computer ...

Personal Computer! Well, well, well, that changes everything. We don't drink coffee all the time, you know — orange juice, tequila, Coopers, even water has been known to pass our lips. And only one of us smokes real cigarettes — the rest of us puff bravely on the chocolate variety. So, you're a PC user, just like us, eh? Write a few programs every now and again, do you? Know the difference between Multiplan and Medicare? Wouldn't slip up and put your words in a food processor, would you? Oh, you'd be surprised at some of the copy we get in this office ...

The fact is, many of our readers do have something of interest to say to others of our readers. Everything you go through in setting up your machine, in getting programs to run, in tailoring programs to your application, and so on, is very similar to what another new user will have to go through. Your experience is marketable, as is the kind of expertise many people eventually develop which enables them to evaluate different kinds of software or computers, comparing them with other similar products and giving informed opinions of them — in short, this kind of expertise makes some computer users capable of writing valuable reviews.

Your Computer offers quite some scope for anyone with a journalistic bent, as you must have gathered from the range of writing styles which appear in the magazine.

No Frills to Speed Thrills

Nearly all of you would be familiar with Les Bell, that urbane, authoritative man-about-computers who tells you what you most want to know. Then there's Frank Lee, whose highly entertaining and informative sleight of pen lets him get away with supplying us with far longer articles than we asked for — and having them printed ▷

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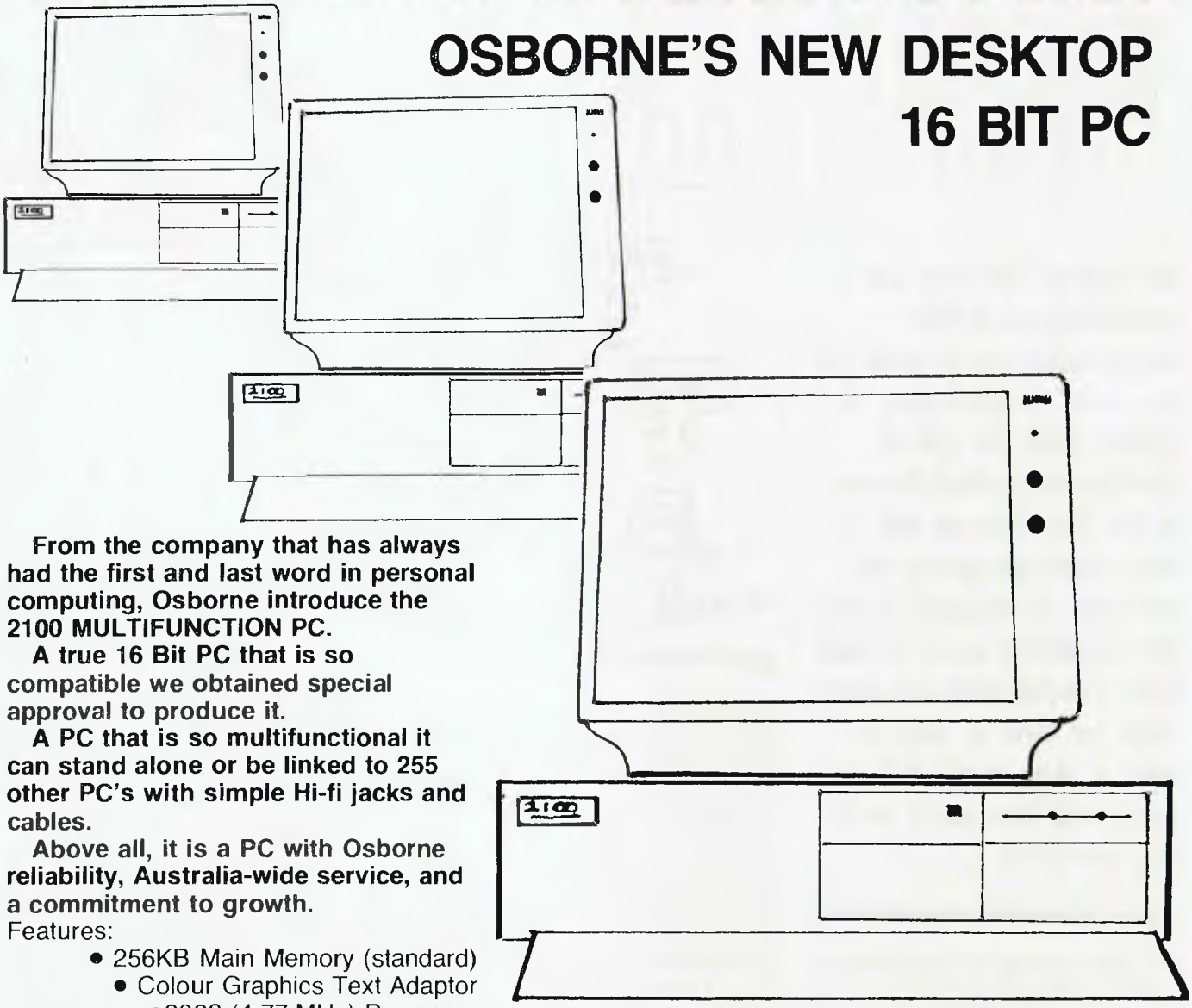

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(and paid for) as such because they're much too good to cut.

Matt Whelan, still afflicted with the revhead habits of his motoring days, comes out of his writing retirement (he prefers 'writing retirement' to 'lazy') when we're testing a machine with an East African Safari game, whenever one with a fast processor comes in ("Wowzappee! This 80286 goes from 0-100 in 5 milliseconds!"), or when we just want to upset your reading routine with some sideshow-alley hype.

Rose Vines' tutorial skills are legendary at Federal Publishing, where we've got lots of new computer users, and her comprehensibility suffers not at all from being put on paper — she's also got a great sense of news. John Nicholls, our Lotus Hotline columnist and gatherer of knowledge of word processors, is a stickler for facts and information — no frills.

(Managing editor's comment: "By popular vote, we made Natalie Filatoff editor so she wouldn't have time to write any more. It's better for her to feel overworked than for the rest of us to feel upstaged.")

Though a good part of the appeal of our writers lies in their different styles, there are some characteristics common to all of them, and for which we depend on them. First, we know they are as accurate as it is possible to be; they don't surmise, they check their information. Another trait of our regular, most fondly thought-of contributors and staff is they supply easy-to-handle copy.

Your Computer has always published guidelines, on the 'Services' page, for would-be contributors. Sadly, so few people seem to follow these that it might only be once every two months when, during the daily opening of mail, we find occasion to gasp, "Someone's followed the guidelines!" Such contributions are usually clasped to one's breast and spirited away to be read immediately.

The Trick Is ...

So what do you have to do for us to react favourably as soon as we tear open your envelope, rather than having your article join the pile of 'Things to be attended to soon(er or later)'?

What we most prefer is for would-be contributors to talk to us about what they intend writing, before actually putting finger-tip to keyboard. You can either write or ring us, giving an outline of your idea for an article. We can tell you if the topic has already been covered (such an article may already have been published or commissioned), give you an idea of how long the piece should be (we really don't like cutting copy — it spoils the intended flow of the writing), and maybe help you with some contacts, sources of information that could be of use. From our point of view, knowing what's on its way let's us allow for it, and stops us commissioning it from someone else.

So, now we're at the stage where we can recognise your name on the envelope when it lands in the office. If you send your copy in manuscript form you should:

- Type or print on plain white paper.
- Devote the opening page to your name, address, home and office telephone numbers (in case we need to check details), and a suggested title for your article.
- On subsequent pages, it helps us enormously if the copy is double-spaced (it makes it easy to sub and type into our computer) and pages are numbered, with your name at the top (in case pages get separated).

If you're submitting an article on disk, you should be informed that while we accept a wide variety of formats, some have to be converted outside our offices, which adds to the (often lengthy) delay between receipt and acknowledgement of your work. The preferred medium is IBM standard format, single-sided, single-density, 20 cm disks. We can also handle, in-office, in double-sided 13 cm format, disks from the Compupro 800K, Epson QX 10, Morrow MD-3, NEC PC-8801A, Otrona Attache, Sanyo PC, Televideo 802/803 and the Zenith Z-100, IBM PC running CP/M-86, and IBM PC running MS-DOS version 1.x or 2.x; in single-sided format we can take disks from the DEC UT-180, Cromemco CDOS (double density), TI Professional PC, IBM PC running CP/M-86, IBM PC running MS-DOS Version 1.x or 2.x, Xerox 820-II (double

density), Zenith Z-90, Morrow MD-2, NEC PC-8801A and Osborne 1 (double density). We've also got a Kaypro II, an Apple IIe and a Microbee (disk or cassette) between us, so we really can handle most things.

If you're going to send disks, you should:

- Pack the disks extremely carefully.
- Label them with your name, address and phone number, and the names of the files on each disk.
- If possible, supply us with hard copy as well (so we have something to check against if there are any hiccups in transferring the files to our system).

Contributions by Telephone

A third option for sending your copy is to use the *Your Computer* bulletin board. If you have a modem and suitable software (in the MODEM7/YAM mould — see our stories on Christensen Protocols in the May and June 1983 issues), you can transfer material direct. The bulletin board is online 24 hours a day, seven days a week. Contact our office by phone for details.

Easy Reference, Visual Bits and Listings

Whenever appropriate, you should consider using one or more tables to convey significant points in your article. Think of tables as synopses of elements of the article. Keep in mind that your readers often look at the tables before reading the article, to help them decide if the article is of interest to them. Put each table on a separate sheet and identify it on the sheet and in the text as Table 1, Table 2 and so on. We will produce captions, but your suggestions will help greatly. Pencil sketched tables are all right; concentrate on clarity and order of presentation, not beauty. Frontier Technology (our typesetter) will typeset them so they look terrific. ▷

Diagrams and so forth are also accepted as readable sketches from which our artists can work. Again, put each figure on a separate sheet, labelled Figure 1, Figure 2 and so on. Keep in mind our artists are not engineers. It's easy to overlook crucial but tiny details in elaborate figures. Mistakes will be kept to a low probability if you: keep figures simple; attach a note warning about likely mistakes ("note the tiny circle on the top triangle").

It's also imperative that we get all program listings *right*. It is best if we can photograph your listing and print it as it is — if the computer typed it, the computer probably accepted it. In order for this to work, we need a clear, sharp, original printout. Please print your listings with a new ribbon (you wouldn't believe the lighter shade of pale we receive from some people — *please* treat yourself to a new ribbon for the occasion). If you are using a dot-matrix printer, consider using your printer's double-strike mode to get a really crisp image. We have to tear the sheets apart to shoot them, so please don't print on the perforations.

In Style

On the subject of style, it is perhaps most helpful to say you should aim to address your audience. Characteristic of all *Your Computer* readers is enthusiasm for computers and a desire to know more about how to use them to the greatest advantage. Our readers comprise people looking to buy a computer, beginners in both the home computer and business areas, hackers, programmers and experienced users.

Obviously we try to incorporate both beginners' material and information for those with more computer knowledge, but even if your article is directed at the advanced user try to avoid jargon and be as comprehensible as possible.

We are aware that many people who have something to say to our readers may not be professional authors. We, of course, ask that manuscripts be as polished as possible, but we can fix ordinary misspellings and errors in punctuation whenever needed. Our readers, however, do demand clarity and a logical order of presentation, and these are things that we cannot edit after the fact. The following suggestions for presenting your work are borrowed from guidelines distributed by the publishers of Dr Dobb's Journal (a highly respected American publication) to its would-be contributors — they happen to correspond very well with *Your Computer*'s requirements:

'The **Opening**: Your article should open with an interesting and concise explanation of what it is about and why it is worth reading. The purpose of this paragraph is to ▷

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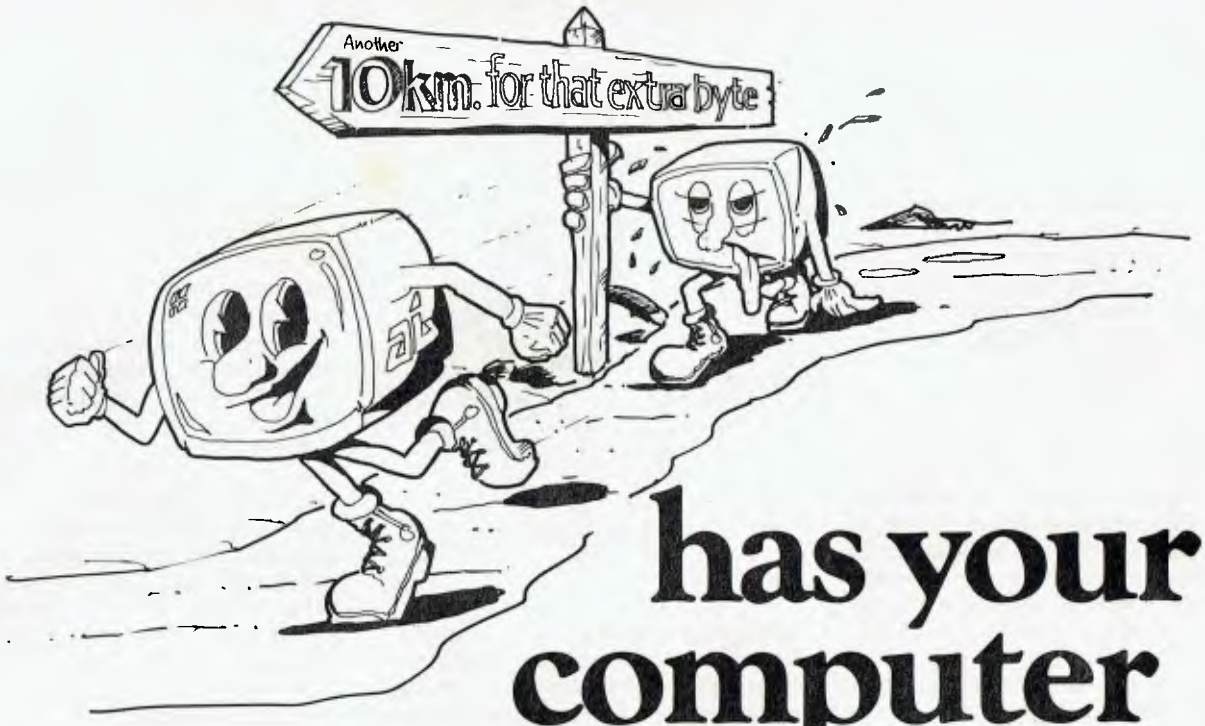

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motivate your reader to keep reading, not just provide an abstract. It's like the destination sign on a bus. Would you board a bus that didn't have a sign saying where it was going? Neither will your readers carry on with an article that doesn't begin by telling them its destination.

'The Development: The bulk of your article is simply an expansion of the opening. Your aim should be to make the matter clear enough that your reader can apply the same solution or method in his or her own situation. It's best to work from the simple to the complex, from the fundamental to the elaborate. Establish the essential points first; introduce the complications, the implications, and the on-the-other-hand points afterwards ..."

The above, of course, reminds you that you should always give credit to your sources. Quotes are good things: they show you've researched your topic and, when used correctly, give credence to your own ideas. It's also against the law to present another author's material as your own.

Hitting the Right Tone

Dr Dobb's suggests you 'speak on paper as if your were giving a brief, informal talk to a group of co-workers. You want to be concise and well-organised because you don't want to waste their time, but you won't be stuffy or academic because you know them.'

Examine the styles of the writers I've mentioned above. You won't find essay form, flowery prose, scientific papers, or philosophical tracts among them. Though such forms of writing are an art in themselves, they aren't suitable for *Your Computer*.

What We Really Want to Know

So, exactly what kinds of contributors' articles are we looking for?

We'd like to know about it if you want to review a machine or some software. Generally, we expect reviewers to have some experience with products in the same area as those they wish to evaluate. It helps, for example, if you want to review a new Osborne computer, if you have some knowledge of other Osborne machines. A review of a word processor has more depth if it can compare functionality, speed, ease of use, and so on, with other word processors in the same price range. There are of course exceptions to this rule — like if you want to review the only database program available for a particular machine.

We're trying to keep our reviews to two or three magazine pages, including photos,

comparative graphs and necessary diagrams. That means you should write around 1500 words. Reviewers are also asked to fill out a form (which we'll post to you on request) giving the vital statistics of the machine or package under review. This can serve as a guideline to you when writing the review, as well as providing us with an accurate file copy of specifications.

If you do have the facilities to photograph the machine or package, we'll pay extra (in addition to the writing fee) for good quality black-and-white prints and/or colour transparencies. In the case of a computer, we need views of the entire machine, the screen, the keyboard, the ports, and, if possible, of its innards.

With software reviews we require a photo of the package, showing all components, and some screen shots which best illustrate how the program works (usually menus and some sample work screens). Most reviewers aren't able to provide such material — please let us know. It takes time to contact distributors and organise to borrow products for photography; we can do it while you're writing the review, so it can be placed in the magazine with minimum delay.

We're also interested in user reports. These might explain exactly how a beginner went about setting up a program or machine, pitfalls to avoid, tips for advanced use and so on.

For our business section, we and hundreds of other business users would like to know *exactly* how you made some software, configuration of computers or combination of the two do the job in your business environment. Did computers solve a particular problem? Would you have been better off with a manual system? We learn by example and if you've made it work someone else can benefit from your experience.

'Instruction Set' has so far been a section of the magazine devoted to teaching people to use particular languages to the best advantage. We're also looking at tutorials on how to use more general software packages, and hardware-oriented material for this section. For example, we are working on an article explaining how to make your own computer cabling.

Pocket Programs has always been a popular component of *Your Computer*, partly because the listings allow you to make something happen on your screen right away, and because they give an invaluable insight into how computers work. Games are always fun, and we're keeping our eye out for more useful utilities and full-blown programs to publish. (Please follow carefully the instructions given earlier for producing listings.)

While most articles in the magazine should be objective, you can be as subjective as you like in Textfile, our letters column. We'd like to get a more lively forum of ideas going here, so let it rip. Letters will only be considered for publication if they include your name and address — if you can't put your name to a letter you probably shouldn't be writing it. Legitimate requests for anonymity will be respected.

Remuneration, Payment ... Money?

You won't get paid for airing your opinion in Textfile, but we do pay well for other contributions. The rate depends on factors such as how much time a writer may have spent on research, or how much time our sub-editors have to spend repairing his or her style and grammar. The fee can vary from $50 to $150 a thousand words. Our best writers negotiate their own fee and invoice us accordingly.

Federal Publishing's company policy — like most publishers — is to pay writers on publication of their material. Unfortunately this, coupled with often inevitable delays in finding an appropriate slot for an article, can result in a long wait for both payment and seeing your name in print. We do make every effort to publish contributors' material promptly.

We're looking forward to hearing your suggestions for articles. If you can make it to one of our synergistic beer-drinking sessions on the first Wednesday of every month (see the News in this issue for details) so much the better. We'll recognise you by the blisters on your fingers, the coffee cup hooked carelessly over your right thumb and the cigarette, real or otherwise, dangling purposefully from your lips. □

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DLAST OF DBASE

In which the case is solved, the crime unravelled, the culprits revealed, the series wrapped up.

WE NOW KNOW how to code up an application in dBase: we're fully conversant with the dBase Application Development Language, know the tricks of using dBase and know something about structured programming. This month, we're going to turn our attention to system design, the stage before we actually write the program.

In particular, I want to look at the techniques of database design, which I alluded to in the introduction to this series. It's important to understand some of the underlying ideas on which dBase is based, in order to get the best out of it.

dBase is claimed to be an 'assembly language relational database manager'. What does this mean? Assembly language means the program was written in the lowest level, and potentially most efficient, language for the particular processor. dBase was originally written in Assembly language for the 8080 microprocessor and was subsequently translated (by machine) into 8086 Assembly language for CP/M-86 and MS-DOS.

Some parts of dBase are not as efficient as theoretically possible; I am told the SORT command, for example, uses a very primitive form of sort called the bubble sort. However, on the whole it's not bad.

A database manager, as outlined at the beginning of this series, is a program which offers both commands for the direct manipulation of data items and a built-in programming language (or interface to another language).

Which leaves us with the term relational. What's this particular piece of jargon about?

The relational database was developed during the late sixties by Dr E.F. Codd of IBM. In a relational database, data items are stored in tables — and that's what the term relation actually means: table. It's important to notice, however, that a database consists of multiple tables, and this is the secret of the power of the relational database.

A simple mailing list, in which one stores name and address information only, can be stored in a single table, or in dBase terminology, a database (.DBF) file. However, a more complex example, such as a customer order database or an employee history database, will require a more complex representation.

Take Students on Record

Take for example a database containing student records. For each student, we would want to record a surname, first name, date of birth and other personal details — home address, a list of classes and subjects, plus parents' address, guardian's address (if different) — and maybe other details.

This could be done by creating a database with the following structure:

```
SURNAME,C,20
CHRISNAME,C,20
DOB,C,6
HSTREET,C,20
HTOWN,C,20
HSTATE,C,5
HPCODE,C,4
CLASS1,C,4
CLASS2,C,4
CLASS3,C,4
CLASS4,C,4
CLASS5,C,4
CLASS6,C,4
CLASS7,C,4
CLASS8,C,4
CLASS9,C,4
CLASS10,C,4
PNAME,C,20
PSTREET,C,20
PTOWN,C,20
PSTATE,C,5
PPCODE,C,4
GNAME,C,20
GSTREET,C,20
GTOWN,C,20
GSTATE,C,5
GPCODE,C,4
```

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Already we are getting perilously close to dBase's limit of thirty-two fields per record. Not only that, but the record length is creeping up; it's now 273 bytes and rising.

Adding insult to injury is the fact that many of the fields will not be used, and will therefore contain only spaces. In other cases, fields will simply be repeats of data already in the database. For example, in final years at school, a student might only take five subjects, so that five of the CLASSn entries are blank. Similarly, the parents' address will usually be the same as the student's home address, and the guardian detail fields will not be used. In this case, 138 bytes are blank — which is over half the record length!

A waste of half the database size cannot ordinarily be tolerated. Although the cost of disk storage is still dropping, it is not free. In this case, for a school of 1000 pupils, we can save over 250 Kbytes by eliminating the redundant details and wasted space. How can this be achieved? The answer lies in the concept of the relational database.

The database obviously contains repeating groups of fields, like CLASSn and HSTREET, PSTREET and GSTREET. To simplify the database, we gradually 'boil out' the redundant information in a process known as normalisation.

The first step is to split the database into separate relations. An important rule is that each record (technically called a tuple) in a relation must have a unique key by which it can be retrieved. The simplest way to do this is to allocate each student a student number called STUDID.

We can now create a relation containing the principal details for each of the students as:

```
STUDID,N,5
SURNAME,C,20
CHRISNAME,C,20
DOB,C,6
```

This relation has a record length of 51 characters and contains the essential information about each student. We can now create a separate relation for addresses: ▷

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```
STUDID,N,5
ADDTYPE,C,1    <- H for home address, P for parent, G for guardian
NAME,C,20
STREET,C,20
TOWN,C,20
STATE,C,5
POSTCODE,C,4
```

The unique key for this database is the concatenation of the string equivalent of STUDID with ADDTYPE. In other words:

```
INDEX ON STR(STUDID,5)+ADDTYPE
```

Now, to get the home address of student 537, the command is FIND '537H', while to find the name and address of the parent of student 178, the command is FIND '178P'. Notice the strings are right justified; that's the rule when dealing with the STR function.

Similarly, we can create a relation for the classes:

```
STUDID,N,5
CLASSNO,N,1
DETAIL,C,4
```

and in this case:

```
INDEX ON STR(STUDID,5)+STR(CLASSNO,1)
```

Now, to find student 537's second class, the command is FIND '5372'. Of course, with dBase, the CLASSNO field is not strictly necessary, since to find all student 537's classes we need only say:

```
FIND '  537'
LIST DETAIL WHILE STUDID = '  537'
```

This is a very common technique in dBase programming, but here we are doing it 'by the book', and a fully unique key is therefore required.

At this stage, we have got the database at least into first normal form (there are three levels of normalisation). Any relation which does not have repeating fields is automatically in first normal form, and our three relations meet that criterion.

Second normal form places a further restriction on database design: all the non-key fields must be fully functionally dependent on the primary key. In other words, it should not be possible to predict the contents of any field, given only part of the primary key. In our case, given only part of the student ID, nothing works. For the address relation, given the student ID, you still don't know whether the address is the student's home address or that of a parent or guardian, and vice versa.

Given the student ID, the classes relation is accessible, but one doesn't know which class one is looking at (they are presumably numbered in order of priority to the student). So the database is in second normal form.

To be in third normal form, the database must satisfy a further criterion: there must be no functional dependence between any of the non-key fields.

Technically, this database doesn't quite make it, since the first character of the postcode field is functionally dependent on the state field. For example, if the state field contains 'NSW', then you know the first character of the postcode field must be '2'. To achieve full third normal form, then, this database could contain another relation which would enable us to look up (FIND) based upon state and get the corresponding first character of the postcode. This would save one character for each entry in the address relation, at the expense of code complexity and another database. I don't think it's worth the trouble in this case.

Once a database has been designed in this format, dBase provides a number of commands to assist in manipulating normalised databases. The most important of these is the JOIN command.

The JOIN command takes the syntax: ▷

```
JOIN TO <file> FOR <expression> [FIELDS <fieldlist>]
```

For example, if we wanted to get a database containing all the home addresses of students, we would issue the following sequence of commands:

```
USE students
SELECT SECONDARY
USE address
SELECT PRIMARY
JOIN TO homeaddr FOR P.studid = S.studid .AND. addtype = 'H'
     FIELDS P.surname, P.chrisname, S.name, S.street, S.town,
     S.state, S.postcode
USE homeaddr
LIST
```

The JOIN command concatenates matching records in the two relations to form a new relation, in this case called homeaddr, which contains the specified fields. Here we have the student's surname and first name, from the students database, and the address details from the address database.

New Relations

In practice, true relational databases such as those found on mainframes don't actually produce a new relation when a JOIN command is used. Instead, they create a 'view' of the database, which behaves as though it is a new relation but which actually takes its contents from the input relations. This way, if the real relations are updated, the view also changes to reflect that update. With dBase, the JOIN command will have to be repeated after any database updates so that the derived (JOINed) relation reflects the changes in the main relations.

In this sense, dBase II is not a true relational database. dBase III comes much closer, with its SET RELATION TO command which makes moves in one relation cause moves to the corresponding records in a linked relation. This is especially powerful when used in reports.

In the example above, we normalised the database so it consisted of three relations. The problem is dBase II only allows two files (read relations) to be open at a time. We will thus slow the operation of the system, since on occasions the program will have to record its position in one relation, close it, open another and perform some processing, then open the first relation and resume processing where it left off. All this overhead is probably the major speed restriction on large dBase II systems, and is where dBase III comes in.

We have now worked backwards, from an elementary discussion of the dBase II commands, through programming techniques, bugs and performance improvement to design techniques. By this stage you should be able to implement (and probably have) systems of reasonable complexity — in fact complex enough to strain dBase II to its limits. Given the dBase manual and a few days, you should be able to turn out almost any system which is reasonable for dBase.

So we're at the end. I hope you have enjoyed this series, and I hope dBase continues to work for you as it has for me. It's not the most powerful database package around, but it has made many things possible for people which would not otherwise have been possible. □

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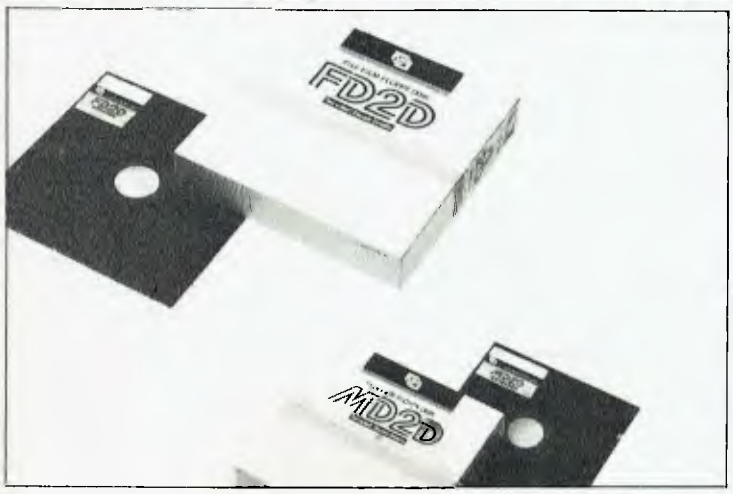

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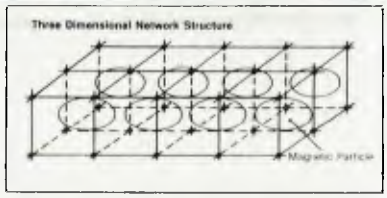

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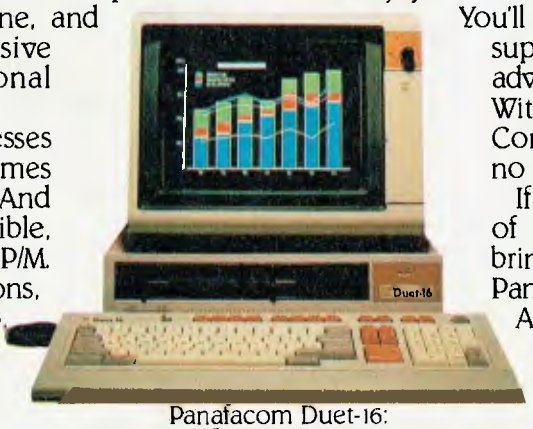

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The comings and goings of Australia's public access messaging systems; and sysops join forces.

Your OS **179**

More on PCDOS 3.0; towards a bugless DOS Assembler; trouble for early-bird PC AT pluckers; and Bill's discovered a 'Gem'.

Your BBC **181**

Now a fully-fledged banana bender, Bruce gives us the bad news about BASIC 2, the good oil on a new book, and says "Frak!" several times.

Classifieds **183**

Buy of the month: an 'educational' program called Meat Pies–blurk!

Lotus Hotline **184**

Save time when printing more than one copy of a worksheet by using a macro.

Books in Brief **186**

Glossary **189**

Services and Ad Index **193**

Next Month **194**

Whitewashed. Or maybe just a little blue-streaked, if we include the bits which didn't fit in this time ...

Q AND A

HOT COMPUTERS

I am a regular reader of your magazine, with a particular interest in your reviews of computer equipment. However, they do not cover the subject of heat. Do home computers generate much heat?

BRIAN WILSON
Canterbury NSW

Home computers rarely generate enough heat to worry about, which is why heat is seldom mentioned in our reviews. Most chips used in micros require very little power, while machines using complementary metal oxide semiconductor (CMOS) processors need even less power and so generate virtually no heat at all.

So on the whole you needn't worry about excessive heat in your computer, although there are some precautions you can take to ensure the safety of your equipment.

If the air vents of the computer are covered or become blocked with dust, it may begin to heat up. We found with one of our computers that dust collecting on the components insulated them and made them liable to overheating. To prevent this happening, make sure you leave a couple of inches of space around the air vents and give them an occasional dust.

If you have limited space available and find your gear is getting hot, you might consider installing a small fan near your equipment to increase the air flow.

Try to avoid turning your computer off and on too frequently. Although the few moving parts in a computer normally take a long time to wear out, the expansion and contraction caused by heating and cooling of chips and circuits can accelerate wear. According to the Macintosh's documentation, you can leave it switched on for five years without damage!

Finally, you should observe all the normal precautions, such as avoiding direct sunlight and other sources of intense heat.

BUYING A COMPUTER

I am about to buy a TRS-80 Extended Colour Computer 2 and am wondering if I have made the right choice of personal computer. Can you advise me about selecting a machine — keeping in mind that I have a limited budget?

I also have a limited knowledge of machine code (virtually nil, actually!) and would appreciate it if you could recommend some books on the subject.

MICHAEL RUSSELL
Cowra NSW

Your question about choosing a personal computer is the one we're most often asked, and our answer is invariably the same: we can't select a PC for you as we don't have detailed knowledge of your needs and the applications you want to use a computer for. All this magazine can do is review new machines on the market to provide guidelines for readers, and run our annual 'Personal Computer of the Year' Awards (see our April issue) to present to the public the 'best' machines released in the previous year, as judged by a panel of independent (that is, they don't work for any of the computer companies) experts. In addition to this we have produced publications such as **Start Computing**, *and* **Buying a Computer** *to provide a few hints on what to look for when choosing a micro.*

In both these publications and the Award articles we basically advise purchasers to assess carefully what they want to do with a computer, find the software that does it, and then pick the best-value machine that will run that software. For example, if you want to do word processing, make sure you get a machine with disk drives that have enough capacity to run the word processor you want to use. On the other hand, if your main interest is in having access to as many games as possible, you'd be best to make sure you get a machine with good graphics and sound.

Of course, we hope **Your Computer** *will make the assessment process easier by determining the good and bad points of computers on the market, stating what they're most suitable for, and considering the value for money they represent and their likely success at attracting good software.*

If you decide to go with the Tandy, a book that will introduce you to assembler (the closest you need to get to actual machine language) is **Assembly Language Programming for the Colour Computer**, *by* William Bardon, *published by Tandy, which costs $9.95 and is available through most Tandy outlets.*

PANDORA'S PRINTER

Since my purchase of an Apple IIe about a year ago, I have been buying *Your Computer*, which I've found a valuable aid in increasing my knowledge of computers and keeping abreast of the changes that continually occur.

One problem I've experienced is the lack of compatibility between various brands of printers and computer cards. For example, I have a Facit 4510 printer and my Apple IIe is fitted with an Automatic Ice parallel printer card. I am unable to dump graphics from several programs (one in particular is Crossword Magic, which has 14 different combinations of printer options — but none for the Facit).

I have contacted the producers of the software and the manufacturers of the printer and the computer card, but none is prepared to offer assistance in achieving some form of compatibility.

JOHN FARRELL
Russell Vale NSW

Unfortunately we're unable to help you with this interface because the problem is most probably between the printer and the software, rather than with the Apple IIe. Problems with graphics dumps aren't infrequent, as there's a fair bit of complexity involved in them.

If the software author had included a customisation routine in the software you might have had a better chance of getting an interface working, but as it stands there's not much chance anyone else would be able to do a successful customisation.

A lot of people run into problems when trying to interface new equipment, and each manufacturer or distributor blames the other for the incompatibility and refuses to take responsibility.

If you apply one golden rule when buying, you could avoid this problem. The onus for operation should rest entirely with the vendor of the new equipment, provided you tell him or her what you want to interface the printer to. In your case, if you told the vendor you were going to attach the Facit to an Apple IIe with Ice card, the vendor should either be able to get it working with the card and computer, or he/she shouldn't have sold it to you. You shouldn't have to pester the card or computer companies; they never made any undertaking that their equipment would work with a Facit printer. Of course, if you didn't tell the printer vendor what you wanted to interface it to, it's likely to be your problem.

So when you're buying equipment to interface to your computer, you should ask the vendor for a guarantee that the gear you're buying will operate with your machine. If the salesperson can't give you such a guarantee it's likely they either don't know how to achieve the interface or aren't sure if it will work, and you should shop elsewhere. If you don't get that guarantee and still buy, you must expect to have the sort of hassles you've described, and also, I'm afraid, that no one will be able to help you, unless you can find a user group member who's overcome the same problem.

This probably doesn't sound a very satisfactory answer to your difficulties, but unfortunately it's the way the market operates, and is probably the only fair way to determine a vendor's responsibility.

MORE SECURE APPLE

I am an Apple enthusiast, saving to buy my own Apple, and I'm learning how to program in BASIC. On one of my disks I have a passwords file which other kids can break out of by hitting Control-C. On the GET statement I have put 'A=VAL(A$)', which is effective at first, but after pushing Control-C and Return about a dozen times the program breaks. Pressing Reset also breaks the program. How can I stop this happening?

DANNY WILSON
Gol Gol NSW

There are several ways to protect your program, of which the most simple is probably to reset the jump vectors as follows:

```
POKE 1010,225
POKE 1011,225
POKE 1012,225
```

At the beginning of your program you should also put an error-trapping loop such as:

```
10 ONERR GOTO 10
```

A short example of how this program might work is shown in the following listing:

```
10 ONERR GOTO 10
20 POKE 1010,225:POKE 1011,225:POKE
1012,225
30 PRINT 'I'M IN THE MOOD FOR LOOP-
ING':GOTO 30
```

This technique is not completely foolproof, but it should make things a lot harder for other kids to break your program. The way to stop the loop is to reboot. □

BY JOHN HEPWORTH

Your BLUE

IT'S QUITE AN HONOUR to be asked to take over this column from a person with the reputation of Lloyd Borrett, and I'll try to live up to the standards he has set.

Normally I'll give you hints, tips and news from one (enthusiastic) user to another, but this month I'd like to tell you about some software I use all the time. One package, the Norton Utilities, is nicknamed 'Power tools for computers'.

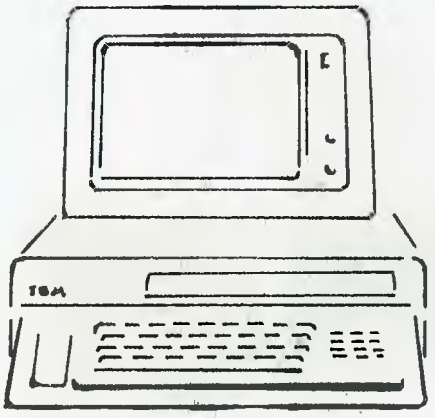
I'm sure readers of this column are more than casual users of commercial software, and need real software tools for real problems.

I use the Norton Utilities and DOSEDIT (all public domain programs), and Sidekick (a recently released commercial package and a finalist in the *Your Computer* Software Product of the Year Awards) all the time. DOSEDIT is covered in an article on public domain software earlier in this issue, so I won't spend any more time on it here than to suggest you *get yourself a copy right now*. If you can't find one on a bulletin board, come to a user group meeting and ask around.

The Norton Utilities

This set of public domain programs is absolutely essential for any serious computer user. I've listed a few of the goodies you'll find on the disk below — just to whet your appetite.

BATHIDE - Hides and unhides files from a batch file, and can also make a file read-only or unread-only from a batch file.
BEEP — Rings a chime. Useful in batch files, to indicate an unattended operation is over.
CLEAR — Clears the screen — not needed for DOS 2.x, but is useful with DOS 1.x.
DISKLOOK — Essential. Allows you to look at a disk, and shows graphically how space has been used, either overall or in one file. Displays the full file directory information on each file. Allows file contents to be displayed in HEX and ASCII.
FILEHIDE — Makes files read-only and/or hidden and/or system and/or sets archive bit. Can reverse any or all of the above functions.
FILESORT — Sorts file directories alphabetically, by creation date, by length, or by extension, and rewrites the directory on the disk in the sorted order.
LABEL — Changes the volume label on diskettes
REVERSE — Switches the monitor to display reverse video.



SECTNMOD — Allows individual bytes in a file to be modified. Does the job infinitely more easily than DEBUG because the new characters are typed into the file over the existing characters, using HEX or ASCII
SSAR — Reads through a disk looking for any sectors in text format (including Wordstar with the high bit set). Writes all to another file on another disk. Salvages damaged files from disk.
TIMEMARK — Batchfile routine which displays time and date on the screen. With piping of output from DOS it can time-stamp a file.
UNERASE — Unerases files, provided the disk has not been written to since the file was erased

Some of these programs are frivolous, but most are heavyweights, and this is not even the complete list. Just imagine being able to resurrect a file you've accidentally erased—that alone is good enough reason to have a copy of the Norton's.

Part of what DISKLOOK and SECTNMOD do overlaps with DEBUG, but the Norton programs make the job of looking into files and modifying them so easy it almost becomes a pleasure. You could never say that about DEBUG.

There's just one thing to be aware of: while the Norton programs work on floppies and the XT hard disk, the hard disk versions of Unerase and Disklook don't work on some external hard disks. My Davong at home and a Tallgrass at work just don't want to know about these two programs. All the other programs work well with floppies and all kinds of hard disks.

Sidekick

Sidekick is about the first program to allow a computer to be used in the way we all really expect; it allows you to interrupt whichever main task is in progress, handle a minor task — like making a note in a computerised diary — and return to the major task, without having to close and reopen files.

Sidekick is loaded into memory at boot-up as the last resident program. It sits tucked away, out of sight, until the Ctrl and Alt keys are pressed simultaneously. This causes activity on the main program to cease, and a mini menu appears in a window on top of it.

Sidekick includes a mini word processor (using control codes similar to WordStar), a memory calculator which works in decimal, hex and binary, and a calendar with appointment book, telephone dialler and an ASCII code table.

Sidekick is compatible with most programs — I have used it over WordStar, dBase II, Lotus 1-2-3, BASIC and Debug. I haven't heard of any problems with other programs.

The ASCII table is great when programming in any language, allowing a check of decimal and hex values for any character, and an on-screen check of the exact appearance.

The notebook allows you to suspend any operation on the screen, bring up the mini word processor, make notes, and return to the primary program. It also allows you to extract data from the screen behind the notepad and put it into a file — great when writing manuals for your fantastic program, excellent for preparing text for import into a Lotus worksheet.

The calculator allows any function to be suspended; you can make calculations, calculate conversions from decimal to hex, and then restart the host program from the exact place it was suspended. Next time you are working with DEBUG, think how useful this could be.

There is one sour note — Sidekick is copy protected (I prefer the word restricted). While some commercial copy programs can make backup copies of it, the scheme does stop you putting a copy on your hard disk, and leaves you with a two-disk boot procedure.

Sidekick should be available from your IBM dealer. If not, try PC Extras in Sydney on (02) 43 4322. Dick Smith is advertising Sidekick as well. □

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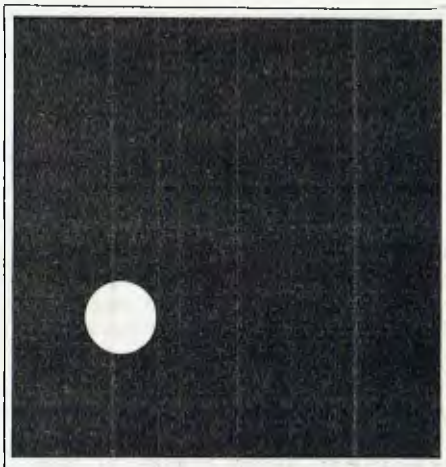

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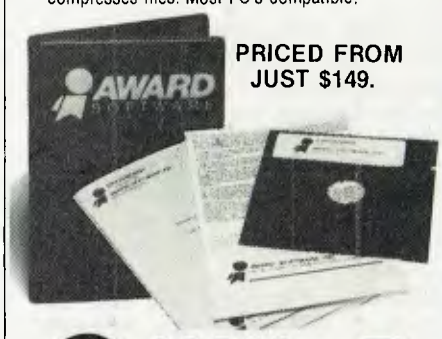

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Programs For The Bee

ONE OF the first things you notice about the Microbee is the relatively short list of programs available for the machine. Microbee owners can turn this lack of software into a distinct advantage by writing their own programs for the Bee. If thousands of packages were already available it would be difficult to have your programs considered for release, but the relatively few good titles give the amateur home programmer a better chance of making the grade.

Don't expect to make your fortune — the pirates soon see to that — but you could easily make your Microbee pay for itself, or you could upgrade to a disk system using the profits from a good program. The most difficult part of the exercise is thinking of a program idea ...

Once you come to developing that terrific idea there are a few programming rules you should follow:

1. Be consistent. If the user is asked to press the RETURN key to enter data — whether Y or N or a number — the RETURN key should be used for all responses. If the user has to enter Y or N, make sure your program will cope with y or n or YES or NO, or any other combination of letters — you can never be quite sure how the user will respond.

2. Make sure you give full instructions for operating the program in your introduction; separate pieces of paper are expensive to produce and are easily lost.

3. *Never* start your program with a blank screen and the words 'Please Wait ..', while you poke the PCG data into the program. Put up the introduction first, then POKE the data for PCG characters, arrays or whatever, while the user is reading.

4. Ensure your introduction is interesting and correct. This will be the user's first impression of your program. A messy title page with lots of spelling mistakes will undoubtedly impress the user — but not in the way you would like.

5. Don't be afraid to use machine language programs within a BASIC program to get the effect you need. Many of the programs that appear to be in machine code are really just BASIC programs with one or two USER routines incorporated. Applied Technology's highly addictive game of Capture is written almost entirely in BASIC, with just a few short machine code routines. (Over the next few months I'll give you some very short and simple USER routines which can be used to give new sounds and new effects in your programs.)

6. Make sure your program is as crash-proof as possible, by testing it; enter wrong information, wrong character types and so on, and see that the program checks for the correct data. Then use the program for at least a month before believing it to be a commercial proposition.

To Market, To Market

Now you have a program, you'll have to make a decision on how it will be marketed. The simplest way is to submit it to Honeysoft, where it will be checked and, if it's okay, it will eventually be released, listed in catalogues and supported by Applied Technology. The company looks after details like getting copies reviewed in magazines such as this one, and in the various user group newsletters — so everyone knows about your program.

Alternatively, you can 'go it alone'. The difficulty here is you must advertise your program month after month, possibly without much response, and unless you are prepared to send out a number of review copies few people will ever hear about your program — let alone buy it.

Since colour computers are experiencing a boom at the moment, the market for good colour programs — both games and utilities — is open for development. The chances of getting your program on a commercial footing are better with the Microbee than with most other units on the market. With over 35,000 Bees out there, you should get a reasonable return for a really good effort.

Help from Across the Tasman

To assist you with your programs, here is a really neat idea from the Wellington (New Zealand) User Group's information-packed newsletter. It's a SEARCH routine which looks for the match of one letter or string within another string of characters. If it finds a match, it tells you where (which character position); otherwise it returns a value of 0. For example, A=SEARCH ('computer', 'put') would end up with A equal to four (it found 'put' at the fourth character position in the word 'computer'). So far that does not look as if it would be especially useful, but it is. A common programming requirement is for a program jump following the display of a menu. The jump takes the user to a particular routine depending on which menu choice he or she makes. For example:

```
200 QO$ = KEY: IF QO$ = "" THEN 200
210 IF QO$ = "N" OR QO$ = "n" THEN 400
220 IF QO$ = "S" OR QO$ = "s" THEN 500
```

and so on.

If this were an adventure program, we would need another line for U, D, E and W. Using SEARCH enables us to simplify this to one line:

```
200 ON SEARCH ("NnSsEeWwUuDd",KEY$)+1
GOTO 200,400,400,500,500,600 ... and
so on.
```

Note, if no key is pressed, KEY$ = "#" which cannot be matched, and the SEARCH function returns a value of 0. The '+1' makes the program go back to line 200 automatically if either no key or an illegal key (not N, S, E, W, U or D) is pressed. For more information on this routine, see the Wellington User Group's newsletter 1984/2 — May 1984 and your Microworld BASIC manual. □

Colin Tringham is a qualified electronics technician with certificates in both Television Engineering and Industrial Electronics. He has been involved with the electronics industry for the past 30 years, in areas such as television receiver design and service, and phototypesetting computer service and sales. He currently looks after the service requirements of a major retailer on Sydney's North Shore.

Colin bought his first Microbee in kit form in April 1982, and upgraded that unit to 32 Kbytes and then to IC speed before purchasing a 64 Kbyte twin-disk colour Microbee which he uses constantly. His main interests are learning to program in both BASIC and Assembly Language, and computer hardware. In 1983, Colin helped form the Sydney Microbee Users' Group, which has now grown into the largest Microbee user group in the world.

His first column deals with turning the shortage of commercial software packages for the Bee into an advantage — the market is yours.

BY BILL BOLTON

PAMS NUMBERS

Developments

Adelaide has a new PAMS system. The Electronic Oracle is running the IBBS software on a President 16 system with a 10 Mbyte hard disk, soon to be upgraded to a 20 Mbyte hard disk, and a second telephone line is planned for the system in the future.

The Electronic Oracle is a subscription system ($35 ayear), but visitor access is available to find out how to subscribe. The system is online 24 hours a day and the sysops are Don Grago and Grayham Smith; the number is in the PAMS list below.

Brisbane gains two systems (or is about to) and loses one. Mark Little, sysop of the BEX RCPM, has a new job with the Jindalee over-the-horizon radar project in Alice Springs, and has taken the BEX system offline prior to moving.

Two new IBBS systems are due to become available in Brisbane soon from Competron and Hills, both to be run by the respective companies as a way of promoting their services — similar to the Hi-Soft and Computers Galore IBBSs in Melbourne.

Speaking of Melbourne, the Gippsland RCPM is offline for the time being with hardware problems. However, there is a new RCPM online in Melbourne, run by MicroPro Computers; the number is in the PAMS list.

In Sydney the Sorcerer RCPM is offline while it gets new hardware and a new permanent number. Also in Sydney, the Micro Design Lab RCPM is offline as some of the hardware was needed for another project. Replacement hardware is on order and they hope to have the system back online soon.

One way or the other, Alice Springs should have an RCPM system soon. The CP/M User Group of Central Australia is looking at putting a system online in the near future, but it might be beaten by Mark Little's BEX RCPM system, which he says will reappear there.

Sysops Anonymous?

Michael Cooper, sysop of the Sydney TRS-80 Users' Group's Club-80 system, has suggested the formation of a contact group for system operators. Says Michael: "I'm very much in favour of some kind of 'Sysops Anonymous' among us all; despite the hardware differences, I'm sure we can all profit by sticking together.

"My information is that some sysops are having trouble with 'twits'. Apparently one was even visited by Federal Police in connection with his BBS being used for heroin dealings (without his knowledge, of course)! That's just one example of why it would benefit sysops to stick together."

Sounds like a great idea; what do other sysops think?

Open vs Closed Systems

The Melbourne PAMS systems are now nearly all running as closed systems because of problems with irresponsible users. It's a pity to see a public resource abused in such a way. The problem has reached such endemic proportions in the US that there are very few open PAMS systems left in that country, especially since a Californian BBS operator had his equipment seized by the phone company for having 'illegal' phone access passwords listed on the system in a message left by a user

A closed system requires you to register with the sysop, leaving a verifiable name and address, before full access to the system is allowed. As this verification usually involves the sysop in some expense, the closed systems normally have an annual subscription associated with them.

PAMS Numbers — Australia

Queensland (EST)
Software Tools RCPM (ST-RCPM) (07) 378 9530 24 hours
Tomorrowland DIRECT (BRIS-TLD) (07) 286 2438 24 hours
Texas Instruments (TI-BBS) (07) 263 6161 2100-0600 weekdays only

New South Wales (EST)
Mi Computer Club BBS (MiCC-BBS) (02) 662 1686 24 hours
Micro Design Lab RCPM (MDL-RCPM) (02) 663 0151 24 hours
Sydney Public Access RCPM (SPA-RCPM) (02) 808 3536 24 hours
Ausborne UG RCPM (AUSBD-RCPM) (02) 95 5377 24 hours
Tesseract RCPM (TES-RCPM) (02) 651-1404 24 hours
Omen RTRS (OM-RTRS) (02) 498 2495 1630-0900 + 24 hours weekends
Sydney TRS-80 UG RTRS (STRUG-C80) (02) 332 2494 24 hours
Prophet BBS (PROPHET-BBS) (02) 628 7030 24 hours
Dick Smith Electronics (DSE-BBS) (02) 887 2276 24 hours
Tomorrowland DIRECT (SYD-TLD) (02) 411 2053 24 hours
Sydney Apple UG (AUG-BBS) (02) 451 6575 24 hours
Texas Instruments UG (TEXPAC-BBS) (02) 560-0926 1900-0600 + 24 hours weekends
Oracle RTRS (ORACLE-RTRS) (02) 960 3641 0-1800 weekdays, 0-0800 weekends
Newcastle Micro RCPM (NMC-RCPM) (049) 68 5385 1700-0830 + 24 hours weekends

Victoria (EST)
Melbourne CBBS (MICOM-CBBS) (03) 762 5088 24 hours
TARDIS RCPM (TARDIS-RCPM) (03) 67 7760 1800-0800 + 24 hours weekends
Sorcerer CUA RCPM (SCUA-RCPM) (03) 434 3529 24 hours
East Ringwood RCPM (ERING-RCPM) (03) 870 4623 1600-2400 daily
PC Connection IBBS (PCC-IBBS) (03) 528 3750 24 hours
HiSoft IBBS (HISOFT-IBBS) (03) 799 2001 24 hours
Computers Galore IBBS (CG-IBBS) (03) 561 8479 24 hours
OMEN IV RTRS (OM4-RTRS) (03) 846 4034 24 hours
MicroPro Computer RCPM (MP-RCPM) (03) 568-8180 24 hours
Gippsland MAIL BUS (GL-MBUS) (051) 27 7245 24 hours

Tasmania (EST)
Mike Scott's BBS (MS-BBS) (003) 34 9411 24 hours

South Australia (CST)
Adelaide Micro UG BBS (AMUG-BBS) (08) 271 2043 1000-2200
Computer Ventures BBS (CV-BBS) (08) 255 9146 24 hours
Electronic Oracle IBBS (EO-IBBS) (08) 260 6686 24 hours

Northern Territory (CST)
Outback RCPM (OUTB-RCPM) (089) 27 7111 24 hours
OMEN II RTRS (OM2-RTRS) (089) 27 4454 24 hours

Western Australia (WST)
OMEN III RTRS (OM3-RTRS) (09) 279 8555 0800-2400 + 24 hours weekends

New Zealand (NZT)

Attache RBBS (ATT-RBBS) ISD + 64 9 78 9084 24 hours
Domestic (09) 76 9084
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BY BILL BOLTON

Your OPERATING SYSTEM

More on PCDOS 3.0

Last month I discussed some of the differences between PCDOS 2 and PCDOS 3, and in this issue's column I'll examine more of the variations.

A fundamental change between PCDOS 2 and PCDOS 3 appears to be in the way DOS functions return information. In PCDOS 2 a successful completion of a function call which did not implicitly return a result would mean the AX register contained a zero (a CP/M convention). The PCDOS 2 documentation doesn't specifically say it should do this, but I have seen programs that rely on it.

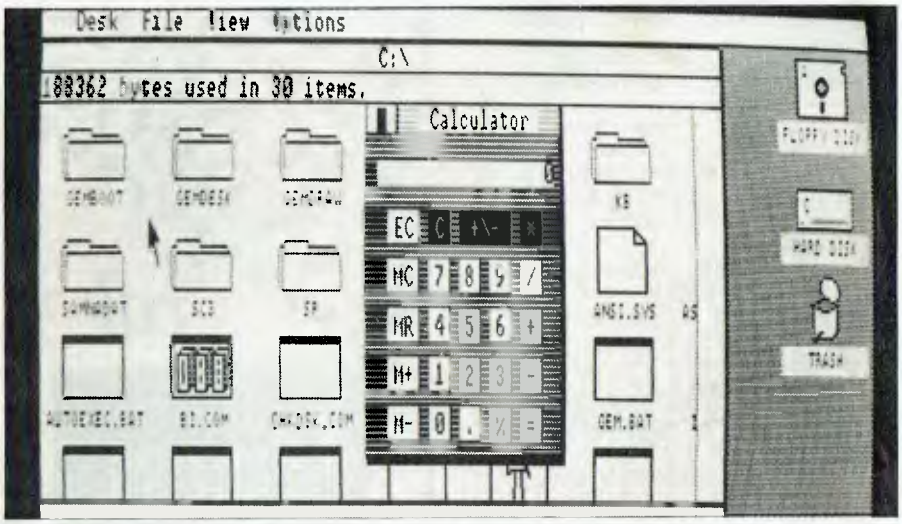
According to the PCDOS 2 technical reference, "If an error condition is encountered, the carry flag is set, and the AX (register) contains a binary error return code." PCDOS 3 strictly adheres to this statement and *unless* the carry bit is set, the information returned in AX has no meaning as far as the success or otherwise of the completion of a function is concerned.

Another undocumented change is to the operation of DOS functions 4EH (Find First) and 4FH (Find Next). The Search First function is used to locate the first occurrence of a filename in the file system, while the Search Next function uses this information to locate its next occurrence. The filename can be ambiguous, such as ???????? BAS, so by using these two functions a program can locate all the files of type BAS in a file system. CP/M programmers will recognise this as the CP/M file system mechanism.

The Search Next function in PCDOS 2 expected the information it needed from the previous Search First to be available in the current DTA. In PCDOS 3 the documentation is a little vague about what it really wants, but it does say the DS:DX registers must be pointing to "the information from a previous 'Find First' call". This could be interpreted as meaning the original filename string address–except that doesn't make any sense. It turns out that what you must do is set DS:DX to the same buffer you set the DTA to before making the Find First call (providing you haven't used the buffer for something else in the meantime).

One of the new interrupts, 2FH, gives access to the resident PRINT function. The PCDOS 3 documentation gives information on how to use this with various values loaded into the AL register. If you follow the specification in the manual you'll be in for a surprise — it won't work properly! What the manual doesn't say is that you must have a value of 1 in the AH register; don't ask me why, but if you put the 1 there it works as expected.

In digging around inside Topview recently I found it also uses this interrupt to do all manner of things which are undocumented for PCDOS 3.



The Gem desktop screen showing a directory of the C: drive open on the desktop with the calculator accessory open on top of it.

Microsoft Assembler

Microsoft has just released a new version of the DOS assembler package, which hopefully will fix the many, many bugs which abound in the old assembler. Some of these bugs have been mentioned before in this column, and I expect it will be quite a while before everyone moves up to the new assembler.

Ray Duncan in *Dr Dobbs Journal* has found another problem with the old assembler/linker. Either the assembler or the linker cannot cope with a DD data declaration statement inside the invocation of structured macro. Ray's '16-bit Toolbox' column in the March issue of *Dr Dobbs* has the details for anyone who is affected by this problem.

Dr Dobbs Journal is a really good read for anyone interested in the technical aspects of small computers — it can be highly recommended!

80286 and the IBM PC-AT

If you're one of the lucky few who have their hands on an IBM PC-AT, here is a little time bomb for you. In its wisdom, Microsoft assigned software interrupt 5 to accessing the Print Screen routine in the IBM BIOS ROM when the company developed PCDOS for IBM. Now the 80286 instruction set has an instruction not present in the 8086/88, called BOUNDS. This allows easy checking of, say, the bounds of an array. When the 80286 detects an out of bounds condition with the BOUNDS instruction it calls software interrupt 5 — which on the PC-AT under PCDOS causes a print screen operation, and as the print screen routine saves all the registers while it does its thing, the BOUNDS instruction re-executes a call to interrupt 5 — which goes on and on until you reset the machine!

I believe IBM in the United States has a fix available for this which modifies the interrupt 5 handler to decide whether it's being called by a BOUNDS instruction. However, I believe at present you'd have to go to the United States for this fix; that's the risk of buying IBM hardware before it's officially released here.

Gem

Those of you who went to the PC '85 show in Sydney last month will have seen Digital Research's hot new product Gem in action on several stands. Gem is an icon-driven ▷

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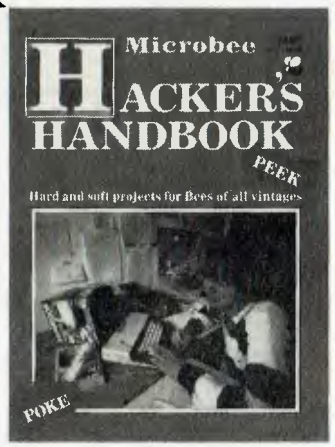

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user interface based on the Xerox Star user interface. Of course, the Apple Macintosh is also based on the Xerox Star user interface, so Gem looks very much like the Mac user interface and provides the same general level of facilities.

DR has a Gem Programmer's Toolkit available for US$1000, which gives the program developer a Gem desktop, a number of standard IBM device drivers, Gem support utilities such as an Icon editor, Gem SID, a resource builder, and more. The important part of the package from a programmer's point of view is the Gem interface documentation and language bindings. The interface specification details all the Gem VDI (graphics interface) and Gem AES (applications environment services) functions, with examples of how to perform the calls from the C language. On disk is a complete set of bindings to the Gem VDI and Gem AES for the Lattice C compiler, and two complete demonstration applications programs in Lattice C. One of the demo programs is word-based, while the other is a graphics-based doodle program.

DR claims anyone with a Mac program written in a high-level language has 80 per cent of the work already done to get their application working with Gem. I showed the Gem Toolkit documentation to Les Bell, who is familiar with the Mac development system, and in his view it looks comparable in terms of the interface and general level of programming effort.

The photo of the Gem desktop screen shows a directory of the C: drive open on the desktop with the 'calculator' accessory open on top of it. The display device is a standard IBM colour graphics adapter and IBM colour monitor. Gem connects to the graphics display device through the Gem VDI, which is a superset of GSX version 1 and uses the GSX/VDI concept of device drivers. As higher-resolution graphics display devices like the IBM Enhanced Graphics become available, Gem will be able to use them in their maximum resolution. Initial video device drivers will certainly include the IBM colour graphics adaptor, IBM enhanced colour graphics adaptor and Hercules monochrome card.

The Gem desktop is due for retail release for the IBM PC and suitably close compatibles in April or May. □

NEARLY TWO MONTHS without my dear old Beeb! I'll definitely think twice before changing jobs again, especially if it involves jumping a couple of state borders and having one's more treasured possessions stored away for unbearable lengths of time. Having survived Brisbane's literally shattering welcome in mid-January, I'm now working at what I enjoy most: producing some more good educational software.

In the first week on the job I was really stopped in my tracks for a while by a bug in BASIC 2. Someone tried to tell me it was an 'enhancement', but as far as I can see it is a pain in the neck and, therefore, a bug! (To find out whether you have BASIC 2, switch on and enter REPORT — if the sign-on message says "(c) 1981" you have BASIC 1, otherwise you have BASIC 2). Enter Listing and RUN it.

The result is not a pretty sight. It seems to stem from the fact that BASIC 2, with the best of intentions, calculates numbers to ten digits, whereas BASIC 1 works things out to nine places. It's all very laudable to add another digit, but BASIC 2 seems to come unstuck quite frequently in the number-to-string conversion routine, in which repeating binary fractions result from the decimal-to-binary conversion process. Though EVAL will turn these errant strings back to what we started with, it doesn't help when you're attempting to pull out a few digits from a string, perform some mathematical message on them and then put them back again, only to find half a dozen unwanted zeros or nines. It gets very tiresome, too, when using LEN (STR$(A)) to, say, check keyboard entry obtained in the form of a character variable. The moral is to avoid STR$ unless there is no alternative. Program carefully around it, then test and re-test your program *very* thoroughly

Don't feel too smug if you have BASIC 1, either. Running the program in Listing 1 will probably start you wondering about whether the accounts you did on your Beeb will get past the taxman after all. There's a lot to be said for working in integers!

```
   10 MODE 7:PRINT TAB(0);"A";
TAB(12);"STR$(A)";TAB(24);"EVA
L(STR$(A))"
   20 VDU28,0,24,39,3,14
   30 FOR A=0 TO 100 STEP 0.1
   40 PRINTTAB(0);A;TAB(12);ST
R$(A);TAB(25);EVAL(STR$(A)):NE
XT
```

Listing 1. BRINGING *out the worst in* BASIC 2.

The Good OS Oil

Thanks to my marvellous plastic card and the decline of Sterling, I was able to buy *The Advanced User Guide for the* BBC *Micro* (by Bray, Dickens and Holmes) for about $15 by mail order, instead of paying the $40 charged locally. This book provides a no-frills description of the Beeb's operating system, interfaces and hardware. It is thorough, well designed and contains more information than any three other volumes I've seen put together. Perhaps the fact that it is published by the Cambridge Microcomputer Centre may have something to do with it; there's nothing like being close to the action when it comes to getting the details! If you're expecting lots of info about BASIC this book isn't for you, but anyone embarking on a journey through the seemingly endless labyrinth of the operating system would need this book before anything else.

Of its 510 pages, 138 are devoted to the *FX calls, and a further 60 to details about 6502 Assembler mnemonics with regard to the Beeb. Other large chunks of space are given to details of the video system, the 6522 VIAs, screen addresses in each mode and the memory map. Hardware hackers will be delighted to find a full circuit diagram and a dozen pages on the 1 MHz bus. I was pleased to find a full summary of the PLOT commands available with OS 1.2 at last, which was absent from my rather early edition of the user guide. Now I know all about horizontal line filling and blanking using PLOTs 72-79 and 88-95. There are also 10 useful appendices with summaries, tables and details of things like how to do upgrades, and sort out the circuit board links while doing so.

It isn't the sort of book you read for fun. The fun comes from getting the nitty-gritty, definitive sort of information that both prevents problems and opens up possibilities. No-one who is serious about programming useful tasks on the BBC could do without it, particularly if intending to use the powerful facilities present in the operating system. At $40 it's good value, but at $15 it was enough to restore one's faith in the international money system.

Frak

Though I usually hate arcade games (well, I can't stand watching other people play them, anyway) I have been more than impressed by Frak, from a publisher that should be called Aardvrak (*sic*) Software. From the first bars of the introduction's musical theme to the last of the three incredibly difficult screens of ladders and jumps, it is a feast for both the discerning games freak and the expert programmer. It is fairly useless to try and describe all the activities of caveman Trog. Armed with a yoyo, he cheerily lays waste a variety of strange-looking cuddly toys and balloons that, if bumped into, cause him to exclaim "Frak!" (and me to say something similar). Virtuoso programming uses the graphics and sound capabilities of the BBC to their fullest and the game looks really stunning on the Kaga III RGB monitor I have at work. It just isn't the same on my green-screen at home — now, where did I put my plastic money?

In the next BBC column I'll be reviewing some ROM-based utilities produced in Australia, and perhaps I'll have time to look at a spreadsheet ROM. I may even get the chance to put a Spitfire through its paces, if I can remember where I left my flying helmet and goggles. □

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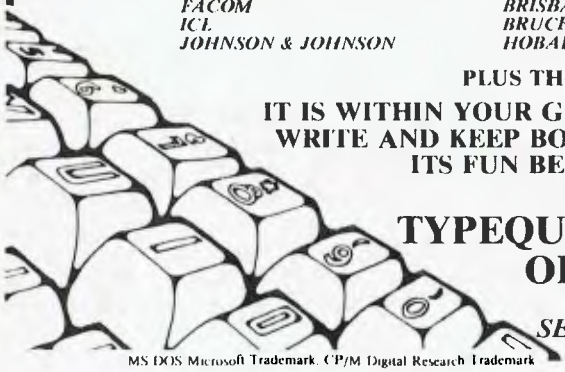

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BY JOHN NICHOLLS

Recently, one of our readers spoke to me about a problem he'd experienced using an HP 7475A six-pen plotter. It appears that instead of 1-2-3 asking him to load six pens, it only asked him to load two, and then plotted the whole graph in only one colour!

Later in the week I was attempting to produce a simple bar chart and found, to my surprise, that I had exactly the same problem. As it turned out, the reasons for this happening to each of us were entirely different. Our reader was using an older version of the printer driver file (LOTUS-.DLB), which catered for the two-pen 7470A, but not for the six-pen 7475A. The newer version of t is file can be identified (using the DOS DIR command) because it's much bigger than the old version (110,360 bytes).

The graph I was trying to produce could not be simpler; all I wanted was a bar chart showing three bars of different colours to represent three different figures. If I entered the figures as three separate ranges, I found the program would not accept a range consisting of only a single entry. If I entered them as one data range, the colours of each bar were the same.

After a lot of experimenting I found the only way I could produce the result I wanted was to specify three data ranges as shown below:

Range A: 8 0 0
Range B: 0 7 0
Range C: 0 0 5

The three bars printed out in different colours, in heights of 8, 7, and 5 units, respectively. Although each colour printed right across the X axis, you had to look very closely to see this. You aren't limited to using this technique with three bars, of course; you can use up to the maximum of six allowed by the program — just increase the number of figures in each range. I have been told that what I was using is a three-way matrix, which sounds impressive.

Texas Instruments

In February's Lotus Hotline column I said there was no version of 1-2-3 for TI computers. It turns out I was mistaken; a special version of 1-2-3 is available for the TI portable and TI Professional.

Multiple copies

Printing more than one copy of a worksheet can tie up a lot of your time. One solution is to use a print buffer, another is to use a macro. Here, by courtesy of Imagineering, are two macros for 1-2-3 and Symphony, which you can use to print multiple copies. If you have never used macros, take the time to read through these, in conjunction with the explanation; you'll find they are not hard to understand. If you are familiar with 1-2-3 macros, you'll find it enlightening to compare the macros in each program.

A Macro for 1-2-3

This macro, when included in your worksheet, is ready to use. The only lines you will need to change are lines 2, 3, 4 and 8.

```
line 1          number
line 2          counter
line 3
line 4          /wgrm
line 5          /rea5.a6~
line 6          /rncNUMBER~a5~
line 7          /rncCOUNTER~a6~
line 8          /xnhow many copies?  ~NUMBER~
line 9          {goto}COUNTER~
line 10         +COUNTER+1~
line 11         /ppral.d3~agq
line 12         {calc}
line 13         /xiCOUNTER<=NUMBER~/xgLOOP~
line 14         /wgra
line 15         /xq
```

Adding the Macro to your Worksheet

- Type the macro as it is written into a blank area in your worksheet — you will need 14 rows and three columns.
- Edit line 6 of the macro to show the cell address of the NUMBER range.
- Edit line 7 of the macro to show the cell address of the COUNTER range.
- Edit line 5 of the macro to show the cell addresses of the NUMBER and COUNTER ranges.
- Edit line 11 of the macro to show the range you want printed; that is, change a1.d3 to the range in your worksheet. Make any other changes to this line that you need, such as headers, footers and so on. If necessary you can use two or more lines within the macro.
- Create the range name LOOP. The cell you should name is line 11 of the macro.
- Create the macro range name p (or any other letter of the alphabet). The cell you should name is line 1 of the macro.

Explanation of the Macro

Line 1: The cells for the range called NUMBER.

Line 2: The cells for the range called COUNTER

Line 3: A blank line to separate the macro from the ranges.

Line 4: Worksheet Global Recalculation Manual sets recalculation to manual.

Line 5: Range Erase erases any figures from the range A5 to A6 created from a previous printing.

Line 6: Range Name Create creates a range name called NUMBER. This indicates how many copies you want printed.

Line 7: Range Name Create creates a range name called COUNTER. This is the counter to check how many copies have been printed.

Line 8: A prompt will appear on the top line of the screen asking, "How many copies?". 1-2-3 will wait for a reply. This number is placed in the range called NUMBER.

Line 9: Goto moves the cell pointer to the range called COUNTER.

Line 10: The formula COUNTER+1 is put into the range called COUNTER.

Line 11: Print Printer Range causes the print range a1.d3 to be selected for printing. Align Go begins the print process. Quit exits from the printing process.

Line 12: (calc) calculates the worksheet, thus incrementing the counter.

Line 13: This range COUNTER is compared with the NUMBER range. If it is less than or equal to the NUMBER, the macro goes to the range name LOOP (line 8) and the printer is requested to make another copy of the range to be printed. If the COUNTER is greater than the NUMBER range, the macro comes to an end.

Line 14: Worksheet Global Recalculation Automatic sets recalculation back to automatic.

Line 15: Quits the macro.

The Macro for Symphony

This macro, when included in your worksheet, is also ready to use. Again, the only lines to change are lines 2, 3, 4 and 8.

Adding the Macro to your Worksheet

Specify the two ranges NUMBER and COUNTER above the macro range. These should be in two separate cells.

- Type the macro as it is written into a blank area in your worksheet.
- Edit line 6 of the macro to show the cell address of the NUMBER range.
- Edit line 7 of the macro to show the cell address of the COUNTER range.
- Edit line 5 of the macro to show the cell addresses of the NUMBER and COUNTER ranges.
- Edit line 11 of the macro to show the range you want printed; that is, change a1.d3 to the range in your worksheet. Make any other changes to this line that you need, such as headers, footers and so on. If necessary you can use two or more lines
- Create the range name LOOP. The cell you should name is line 11 of the macro.
- Create the macro range name p (or any other letter of the alphabet). The cell you should name is line 1 of the macro.

Explanation of the Macro

Line 1: The cell for the range named NUMBER.

Line 2: The cell for the range named COUNTER.

Line 3: A blank line to separate the macro and the ranges being used in the macro.

Line 4: {menu} Settings Recalculation Method Manual sets recalculation to manual.

Line 5: {menu} Erase erases any figures from cells A5 and A6 created from a previous printing.

Line 6: {menu} Range Name Create creates a range name called NUMBER for A5. This shows how many copies you want printed.

Line 7: {menu} Range Name Create creates a range name called COUNTER for A6. This is the counter to check how many copies have been printed.

Line 8: A prompt will appear on the top line of the screen asking, "How many copies?". Symphony waits for a reply. This number is placed in the NUMBER range.

Line 9: Goto moves the cell pointer to the range called COUNTER.

Line 10: The formula COUNTER+1 is put into the range called COUNTER.

Line 11: {services} Print Settings Source Range causes the print range A1.D3 to be selected for printing. Align Go begins the print process.

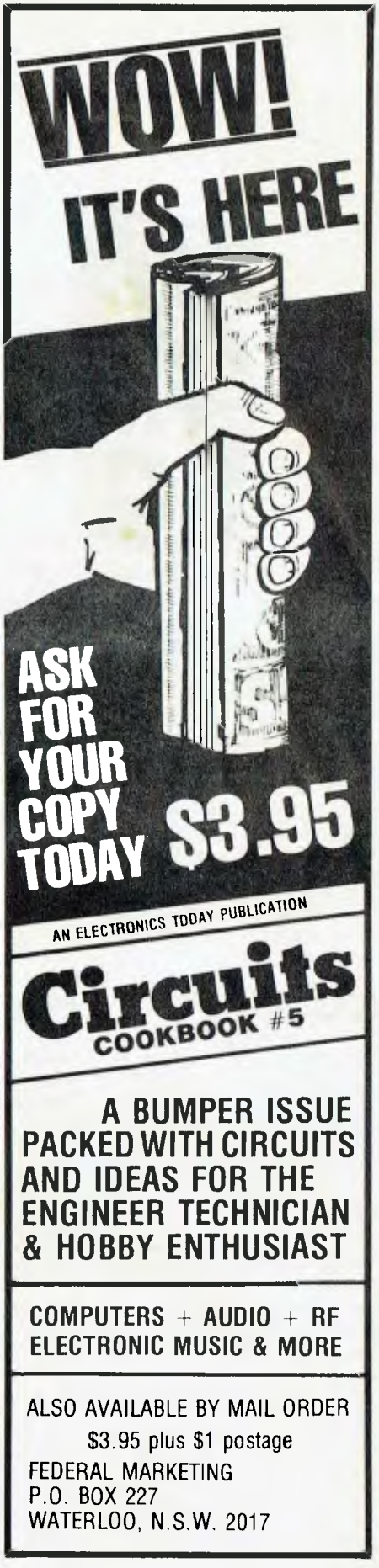
Line 12: {calc} calculates the worksheet, thus incrementing the counter.

Line 13: This range COUNTER is compared with the NUMBER range. If it is less than or equal to the NUMBER the macro goes to the range name LOOP (line 8), and the printer is requested to make another copy of the range to be printed. If the COUNTER is greater than the NUMBER range the macro will come to an end.

Line 14: {menu} Settings Recalculation Method Automatic sets recalculation back to automatic.

Line 15: Quits the macro. □

```
line 1     number
line 2     counter
line 3
line 4     {menu}srmmq
line 5     {menu}ea5.a6~
line 6     {menu}rncNUMBER~a5~
line 7     {menu}rncCOUNTER~a6~
line 8     {getnumber "How many copies?  ",NUMBER}
line 9     {goto}COUNTER~
line 10    +COUNTER+1~
line 11    {SERVICES}pssral.d3~qaqq
line 12    {calc}
line 13    {if COUNTER<=NUMBER}{branch LOOP}
line 14    {menu}srmaq
line 15    {quit}
```

BOOKS IN BRIEF

So many books on computing are being released in Australia these days, it's impossible to review them all. However, we'd hate you to miss out on the one book you've been after for years just because 'Your Computer' hadn't told you it was available, so each month we'll be running this brief summary of the latest releases.

GENERAL

Great Moments in Science
Karl Kruszelnicki
Boobook Publications, $5.95.

If you thought matters scientific were boring and dry this book will change your mind. From computers to cattle dogs howling at the moon there are all sorts of examples of how real people come to grips with technology.

Fact and Future: Australia's Technology Outlook
Edited by Robin Bishop and Daryl Douglas
Productivity Promotion Council of Australia, $12.

An examination of the implications of technology for our society and industry. Will Australia be with the leaders or the followers in the technology race?

A First Computer Dictionary
Brian Sumways and Tony Byrne-Jones
Macmillan Australia, $7.95.

Rave, rave, rave. A dictionary for computer novices, with enough depth to satisfy the more experienced. A key feature is the use of diagrams to make explanations clearer. A valuable addition to any bookshelf. Great value for writers who want to know what good technical writing is all about. I've earmarked this one for an in-depth review in a couple of months.

HOME COMPUTERS

Instant Programming on Your Sega SC3000 Computer
Tony Gerlic
Pitman Publishing, $12.95.

An introduction for owners of the Sega who want to learn about programming. No experience is assumed and lessons are supplemented by subroutines and examples that can be used in your own programs.

Understanding C
Bruce Hunter
Sybex Computer Books (ANZ), $33.95.

An explanation of the concepts of C language programming, including an evaluation of the compilers and environments in which it operates. This book gives specific consideration to C as used with CP/M and MS-DOS operating systems.

Make Programming Your Atari a Game
Alf Foerg
Pitman Publishing, $9.95.

Learn the concepts of programming by following the example of three programs that take advantage of the graphics, sound and colour capabilities of the Atari.

BUSINESS

How to Buy Software
Alfred Glossbrenner
Papermac (Macmillan), $19.95.

A comprehensive guide to the ins and outs of software purchasing. How to make your decision, what to do when something goes wrong, dos and don'ts.

Managing With Micros
Colin Lewis
Blackwell (George, Allen and Unwin), $14.95.

A useful guide for the manager about to take the plunge into microcomputing. Basic concepts are explained, and guidance in choosing a microcomputer and suitable software is given.

Doing Business With Multiplan
Richard King and Stanley Trost
Sybex Computer Books (ANZ), $28.95.

A guide to the use of Multiplan, this book includes 20 templates ready for use in typical business applications such as record keeping, financial statement analysis, sales, finance, manufacturing and master budgeting.

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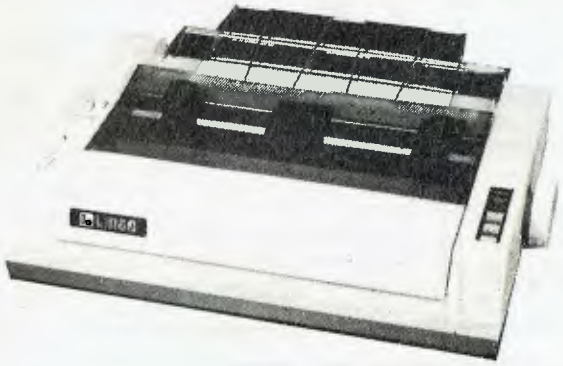

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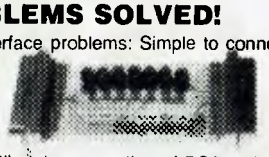

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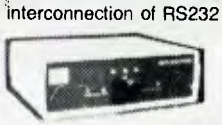

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GLOSSARY

A

Accumulator: The major register of a CPU, in which arithmetic and logical functions are performed. Some computers have several registers which can function as accumulators, in others, some registers can perform a subset of the full set of operations.

Acoustic Coupler: A device for connecting the telephone handset to data communications equipment.

Address: A memory location which can contain data or an instruction.

AI: Artificial Intelligence.

Algol: Algorithmic Language. An early computer programming language for mathematical applications. Widely used in Europe, it embodied early structured programming concepts and was a precursor of Pascal

Algorithm: A set of instructions which define a method of obtaining some result (usually mathematical). A cooking recipe is an algorithm, as is a knitting pattern.

Alphanumeric: Composed of letters or numbers or both.

Analogue (Analog): Representation of a value by a voltage or some other measurable datum, rather than a binary or other representation based on counting.

Application: What you do with your computer. For example games, word processing and graphics.

Array: A set of values under a common variable name, accessed through a subscript. For example A[1] is the first item in array A, A[2] is the second, and so on. A[N] is the Nth item.

ASCII: American Standard Code for Information Interchange; a common system for representing character information.

ASM: Assembler. Also a suffix added to assembly language file names under CP/M to distinguish them from other files with the same name.

Assembler: A program which converts assembly language into its corresponding machine (or object) code, which can be executed by the computer.

Assembly Language: A language in which each machine code instruction is represented by a short mnemonic which is much more comprehensible to the programmer. For example, the 8080 machine code instruction: 10010110is: SUBL(subtract contents of register L from accumulator) in assembly language. Each line of assembly language becomes one machine instruction.

Assign: To make one thing equal to another; for example, |AB| assigns the value of B to A.

Attribute: A property possessed by some object, such as a file being read-only.

B

Background Task: In a multiprogramming environment, a low-priority program which runs when the processor has nothing else to do.

Backup: An extra copy of a disk, tape or file taken as a precaution against damage to the original.

Bandwidth: The range of frequencies that can be carried by a communications channel.

Base: The lowest number inexpressible as a single digit in a given number system.

BASIC: Beginners' All-purpose Symbolic Instruction Code. Invented in 1970 at Dartmouth College by Kemeny and Kurtz as a teaching language, it has since been enhanced in its more exotic forms into one of the most sophisticated yet easy-to-use languages available on personal computers. Its major rival is Pascal, which has the added virtue of stressing structured program design.

Baud: The number of bits transmitted per second along a data communications line.

BCD: Binary Coded Decimal, a 4-bit binary representation of the digits 0 through 9, with two BCD digits usually packed in a byte.

BDOS: Basic Disk Operating System. The major functional component of the CP/M DOS.

Binary: The base 2 system of counting used by digital computers.

Binary Search: A method of finding an entry in a table by successively halving the table until all that's left is the desired entry

Binary Tree: A form of data structure in which entries are tagged on at the end of the appropriate branches.

BIOS: Basic Input/Output System. The part of the CP/M operating system which is different for each type of machine and provides any special I/O routines for disks, terminal, printer, and so on.

Bit: Binary digit, being the basic unit of data storage. Either 1 or 0, off or on, true of false.

Block: A physical division of data in a logical record.

Boot: To load the operating system into the computer from a disk or tape, either initially or subsequently after running a program.

Bootstrap: To use one short program to load a longer loader program which then loads the operating system.

Branch Instruction: A program instruction which causes the computer to jump to another instruction.

Buffer: An area of memory used for temporary storage while transferring data to or from a peripheral such as a printer or a disk drive.

Bug: An error in a program. Makes programmers itch.

Bus: A set of wires over which data, addresses, or control signals are transferred between the central processor and memory or I/O devices.

Byte: A computer word eight bits wide. A byte in memory can hold a character or a binary number between zero and 255 (or -128 and 127), or a computer instruction.

C

C: A programming language, developed at Bell Labs, which is particularly convenient for writing system utility programs.

Call: A jump to a subroutine which leaves the return address on the microprocessor stack, so when the subroutine is finished executing control returns to where it left off.

CBASIC: A commercial version of the BASIC language, running under the CP/M operating system. Doesn't use line numbers on every line, and is compiled, rather than interpreted like Microsoft BASIC.

CCITT: Consultative Committee on International Telegraphy and Telephony The committee sets standards for various aspects of telephone and telegraph usage.

CCP: Console Command Processor. The part of the CP/M operating system that reads a command line and sorts out what it means.

Chain: To automatically run one program after another.

Character: A letter or number, or in some circumstances a control code such as 'carriage return'.

Checksum: A running total of the characters in a file, recorded or transmitted with the file so that errors can be detected.

COBOL: Common Business Oriented Language; a high-level language, mainly used in business applications.

Code:

Absolute: Machine instructions which are intended to be loaded and executed in a particular area of memory.

Object: Machine instructions, as distinct from the source code from which it was generated.

Re-entrant: Code which may be called by more than one program at a time.

Relocatable: Code which can be loaded and run anywhere in the computer's memory.

Source code: A program written in assembly language, or a high-level language such as BASIC, which must then be assembled or compiled to produce the object code which can actually be executed.

Cold Boot: To start up a system from scratch, loading the operating system from disk or tape.

Cold Start: See Cold Boot.

COM File: In CP/M parlance, a command file; that is, a machine code program that can actually be run.

Command: An instruction from the console for the system to do something.

Comment: A note added into a program to help the reader (or programmer) to understand its operation. Does not affect the program's execution in any way.

Compiler: A program which accepts as input a source file written in a high-level language, and produces as output an object file containing the machine instructions which are actually executed.

Concatenate: To join two strings together, one after the other.

Conditional: A test; for example, is X greater than Y:

```
IF X > Y    THEN GOSUB 500
(BASIC)
```

▷

Conditionals are one of the most powerful features of any computer language.
Configure: To organise the I/O or other aspects of a system.
Console: The keyboard and screen from which the operator controls the computer.
Control Characters: Codes which perform functions like acknowledging correct receipt of a message or requesting retransmission of an erroneous message. Control characters are defined as part of the ASCII and similar codes.
CP/M: A disk operating system for 8080- and Z80-based microcomputers. Allows the user to store information and programs in named files, as well as managing disk storage and input/output functions. Other disk operating systems include TRSDOS (on TRS-80), DOS 3.3 (for Apple) and MSDOS on many 16-bit micros.
CPS: Characters Per Second.
CPU: Central Processing Unit. The part of the computer responsible for fetching, decoding and performing instructions.
Crash: A situation where the system becomes inoperative, due to a hardware or software error.
CRT: Cathode Ray Tube. Usually refers to the screen of a video terminal.

D

Daisywheel Printer: A high-quality printer which has a printhead in the shape of a daisy.
Data: Information to be processed by, or output from, a program
DBMS: Data Base Management System. A program which manages the systematic storage and retrieval of a centralised data pool.
DDT: Dynamic Debugging Tool. A program that assists the user to find errors in machine code programs.
Debug: To locate and fix errors.
Decimal: Based on ten.
Device: A piece of equipment such as a printer or tape drive which the computer uses.
Directory: A list of the programs on a disk (or occasionally tape) together with necessary information, such as length and location.
Disk: A flat, circular magnetic surface on which the computer can store and retrieve data and programs. Is fast compared with tape, particularly when information is not stored sequentially.
Disk Drive: The mechanical assembly which rotates the disk and positions the read/write head.
DOS: Disk Operating System.
Disk Operating System: A program which operates one or more disk drives automatically and manages the system.
Display: The computer's output device at the console, usually a TV-like display of letters and numbers; sometimes the computer can produce graphics (charts and pictures) on the display.
Distributed System: A system in which information is stored in several computers; peripherals may be shared, but the information storage is decentralised.
Dot Matrix Printer: A printer which creates a text image from a cluster of dots; produces relatively low-quality, high-speed text and graphic output.
Double Density: A method of recording twice as much information on a floppy disk, requiring a higher-quality recording surface than on a single-density disk.
Driver: A program which controls input and output to a device

E

EBCDIC: Extended Binary Coded Decimal Interchange Code; an 8-bit character coding system — IBM's answer to ASCII.
ED: An editor program; part of CP/M.
Editor: A program which lets you alter and correct source files and other documents.
Error Message: Tells you something went wrong, and sometimes what.
Execute: To run a program; to follow its instructions.

F

FIFO: First in, first out. A technique used in memory management procedures, or a device used in buffering data flow between two asynchronous devices operating at different speeds.
File: A continuous collection of characters (or bytes) saved on a disk or tape for later reloading.
Fixed Point: Counting in integers only. Usually limited to small values, and restricted in accuracy, giving rise to ridiculous answers such as 9/5 1.
Flag: A variable, sometimes a single bit, which can have only two values and is used to indicate some condition.
Floating Point: The kind of arithmetic used in scientific calculators.
Floppy Disk: A disk, made of thin, flexible mylar, and enclosed in a card jacket, which can be used for magnetic storage. There are three varieties, 9 cm, 13 cm and 20 cm. These can typically store somewhere between 140,000 and three million bytes (characters).
Flowchart: Symbolic representation of the sequence of instructions in a program.
Focal: Formula Calculator. A simple language rather like a small BASIC, found on some mini and microcomputers.
FORTRAN: Formula Translator. One of the first computer languages, and beginning to show it, although still the king of the scientific or number crunching languages.
Function: A sub-program that processes variables in some well-defined way.

G

Garbage Collection: The process of going through memory or disk space, reclaiming all the redundant used space.
Gigabyte: One thousand megabytes (1,024,000,000 bytes).
Glitch: A pulse of electronic 'noise' which may cause a system failure.
Global: A variable which is known to all the parts of a program. See local.

H

Handshaking: A technique for controlling data communication between two devices; data flow only occurs when the receiving device sends a signal indicating it is ready to receive.
Hard Disk: A disk made of hard material, which is larger, faster and more fragile than a floppy disk, but capable of storing 70 million bytes or more.
Hard Copy: Printout.
Hardware: The bits of a computer you can kick, as opposed to the programs you can only swear at.
Hashing: A method of reducing the size of a table which otherwise would have mostly empty entries.
Hexadecimal: The method of counting to the base sixteen or the method of splitting binary digits into groups of four, which is the same thing. In hex, you count: 0 1 2 3 4 5 6 7 8 9 A B C D E F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22.

I

IC: Integrated Circuit.
Identifier: A label, or the name of a variable.
Index: A variable which usually points to an entry in a table or list.
Index Register: A processor register which is used to access tables and lists in memory.
Indirect Addressing: Referring to a variable which actually contains the address of another variable.
Inkjet Printer: A device which prints by electrostatically aiming a jet of ink onto the paper.
Input: To get data into the computer.
Instruction: A step the computer can perform.
Instruction Set: The range of commands which can be performed by a particular processor.
Integer: A whole number.
Integrated Circuit: A circuit built on a single chip of silicon.
Interface: The (hardware or software) connection between any two devices.
Intermediate Code: A special kind of object code which cannot be run directly on the computer, but must be interpreted.
Interpreter: A program which examines source code a line at a time, decides what it means, and then does it. Compare with compiler.
Interrupt: To electronically drag the computer away from what it is doing in order to respond to some time-critical situation.
I/O: Input/Output.
I/O-bound: A process in which the performance speed is limited by the speed of input/output.

J

Jump Instruction: Normally, control proceeds from one instruction to the next, one after the other. A jump instruction passes control, not to the following instruction, but to some other. Jumps can be conditional

K

Kilo-: Prefix meaning one thousand.
Kilobyte: 1024 bytes (Kbyte).
Kilobaud: 1000 baud (Kbaud).

L

Label: A word which identifies the destination of a call or jump instruction, or simply identifies some location in memory.
LAN: Local Area Network.
Language: The set of instructions, and rules for stringing them together, which you use to instruct the computer what to do.
Laser Printer: A printer which works a bit like a photocopier, but uses a laser to draw an image directly onto the printing drum.
LCD: Liquid Crystal Display.
Library: A set of programs, or sub-programs, that can be called from your program so you don't have to waste space with a block of commonly used code; for example, a date routine can be held in a library.
LIFO: Last In, First Out. A device or data structure in which the most recent item stored is the first available for retrieval. A stack is a LIFO.
Line Number: A number at the beginning of a line, which identifies it in a similar way to a label.
Line Printer: A high-speed printer for computer output.
Link: Part of a data item in a list, which tells the computer the location of the next data item
LISP: List Processor. A language much favoured by the artificial intelligence community.
List: A sequence of consecutive data items
Load: To transfer some data or program into the computer memory.
Locate: To 'fix' a relocatable code so it will only run if loaded in a particular location
Local Area Network: A system of interconnected computers, within a limited geographical space (usually in a single building).
Logical Device: A device as the computer 'sees' it: what the computer regards as the 'list device' may be one of several 'physical devices', such as a line printer or teletype
Loop: To repeatedly execute a sequence of instructions; part of a computer program that is so executed.

M

Machine Language: The binary codes the machine actually executes.
Macro: A user-defined sequence of instructions which can be inserted anywhere in a program. See Library.
Macro-assembler: An assembler which can utilise macros.
MBASIC: Microsoft BASIC, the BASIC used in the TRS-80, PET, Apple II and so on.
Megabyte: One thousand kilobytes — 1,024,000 bytes (Mbyte).
Memory: Where the computer stores data and programs internally for fast access.
Menu: A display which offers the operator a choice of alternatives.
Microcomputer: A small computer based on a microprocessor.
Micro-floppy: A 9 cm 'floppy' disk, produced with a rigid plastic case.
Microprocessor: The central processing unit of a computer, built into a single silicon chip.
Millisecond: One thousandth of a second.
Mini-diskette: A 13 cm floppy disk.
MIPS: Million Instructions Per Second. A measure of processor speed.
Modem: Modulator/Demodulator. Device used to link a computer to the telephone line. It encodes digital bits into frequencies, and vice-versa
MOS: Metal Oxide Semiconductor. Technology used for manufacturing high-density semiconductors. CMOS (complementary MOS) technology is characterised by low energy consumption, and is increasingly used in portable computers
Mouse: A device connected to a computer which, when moved around on a desk, moves a pointer on the computer screen.
MP/M: A multi-user version of CP/M.
Multiplexer: Device used to divide a communications line among a number of users

N

Nanosecond: One billionth (.000000001) of a second.
Nibble: Half a byte (4 bits)
Node: A connection point on a network.
Network: A system of inter-connected computers.

O

Object Code: Machine code.
Object File: A file containing object code.
Object Module: An object file containing part of a program, ready to be linked to others.
Octal: The system of counting to base eight, or grouping bits in threes.
Offset: To give the operating system the characteristics of a file so that it can subsequently read or write it.
Operand: The number an operator (+, −, and so on) operates on.
Operator: An arithmetic function or some other function which alters variables
Optic Fibres: Cables made from thin fibres of glass (or similar material). Signals are encoded as light and transmitted along the cables.
Optimisation: Making a program work better (or faster, or using less memory).
Output: What the system produces.
Overlay: A technique for efficient use of memory space, in which different routines use the same memory locations. Routines using the same area are held in a backup store, and transferred into memory when needed

P

Packed Data: Data which shares the same address, and has to be unpacked before use
Packet Switching: A system of communicating data by dividing it into small packets addressed to particular receivers
Page: A length of memory, typically 256 bytes
Parallel Transmission: A method of moving data so that all elements of a compound unit are sent simultaneously. For example, the eight bits in a byte may be sent at the same time by using eight channels. This is the method used within the computer, and with some printers. Fast and expensive
Parameter: A constant which sometimes has to be varied.
Parity: An extra bit on the end of a character or byte for error detection.
Pascal: A modern structured language which may eventually rival BASIC in popularity for microcomputers.
Password: A secret word the system may demand of you before allowing you access to certain (or all) programs or data.
Patch: A temporary (ha, ha) fix on a bug.
Peripheral: A piece of equipment the computer uses, like a printer, disk drive, or modem.
Physical Device: See Logical Device.
Picosecond: One trillionth (.000000000001) of a second.
PIP: Peripheral Interchange Program. A CP/M utility for copying files between devices.
PL/I: Programming Language One. A good general purpose commercial language.
Pointer: A variable used for indirect addressing.
Polish Notation: A method of separating operators and operands, for example, + 5 4 is Polish notation for 4 + 5.
Poll: To ask a peripheral if it requires service. For example, a processor will regularly check a terminal to see if it has output ready to be processed.
Port: A physical input/output connection point.
Postfix Notation: Also known as Reverse Polish Notation, this is similar to Polish, + 4 5 means 4 + 5
Preprocessor: A program which does part of a job to make life easier for the program which follows, for example, a macro processor before an assembler.
Priority: The resolution of which interrupt is serviced first if two should arrive at the same time.
Process: A program.
Processor-bound: A process in which the limiting performance factor is the speed at which the processor can perform the required computations
Program: A sequence of instructions which can be understood ▷

and ultimately followed by a computer.
Prompt: A message asking the operator or user to supply information.
Protocol: The rules governing the exchange of information between two devices.

Q

Queue: A list in which entries are made at one end, and removed from the other.

R

R/O: Read Only; cannot be overwritten.
RAM: Random Access Memory
Random Access Memory: The computer's internal memory, which is used to hold running programs and data. The computer can write and read RAM.
ROM: Read Only Memory.
Read Only Memory: Internal computer memory used to store programs, which cannot be erased or overwritten
Reader: Paper tape input device.
Read/Write Head: The small coil which reads and writes on the surface of a disk.
Real-time: A system in which the processing of data input to the computer takes place virtually simultaneously with the actions which generate the data.
Record: A set of related data items. For example, an employee's name, address, payroll number and pay rate.
Recursion: The ability of functions in some languages to call themselves.
Re-entrant Code: Code which can be used by several programs simultaneously, keeping separate data for each.
Register: A location in the processor capable of performing logical or arithmetic functions on the contents.
Relocatable: Capable of being moved in memory.
Relocatable Object Module: Part of a larger program consisting of many such modules, all linked together and located.
Resident: Permanently in the system.
Reverse Polish Notation: See Postfix.
RS232: (also RS232C) Registered Standard 232C. A widely used standard for connecting components in a computer system.
Run: To execute a program.

S

S100: A popular 100-line microcomputer bus, originally developed for the first 8080-based computer.
Save: To store a program on disk or cassette (particularly BASIC).
Screen: See CRT.
Sector: A section of data on a disk.
Serial Transmission: Movement of data one bit at a time. One byte will be sent as eight bits, one following the other. Cheap and slow.
Simulation: Making one system behave like another.
Software: Programs.
Source Code: The original text form of a program.
Source File: A file of source code.
Source Language: The language the source code is written in; for example, BASIC, Assembler, C.
Sort: To arrange items of data in order.
Spool: Simultaneous Peripheral Operations Online. A method of outputting information by queuing information for low-speed output devices, while simultaneously continuing other computer operations.
Stack: A list in which both entries and removals are made at the same end. A microprocessor usually has a hardware stack which is used to save subroutine return addresses, for temporary storage of data, and to pass variables between subroutines.
String: A sequence of characters.
Submit: To put the system under control of a file of system commands.
Subroutine: Part of a program which can be accessed from several points within the program.
Symbol: The name of a variable or a location in memory.
Symbol Table: A table constructed by an assembler or compiler to give the addresses of all variables and labels in a program.
System: A collection of hardware and software, possessed of the property that the whole is greater than the sum of the parts
System Disk: A disk carrying the operating system.

T

Teletype: An electro-mechanical printer/keyboard.
Terabyte: One thousand giga bytes (1,024,000,000,000 bytes).
Timeshare: Running several programs on a system simultaneously.
Track: The area under the read/write head during one rotation of a disk.
Transient: A program that is only in memory for a short time before being overwritten. Often, the only program that is not a transient is the operating system.
Tree: A list in which each data item may refer to several others.
TTY: See Teletype.

U

UART: Universal Asynchronous Receiver/Transmitter. A device which handles the serial-to-parallel and parallel-to-serial conversion of bits in a data message.
Unix: A multi-user, multi-tasking, multi-programming operating system.
Utility: A program of use to most users.

V

Variable: Named quantity that can take on different values.
VDT: Video Display Terminal.
VDU: Video Display Unit.
Verify: To check that data written on a disk or tape can be read again correctly.
Viatel: Telecom Australia's videotext system.
Videotext: Also known as viewdata. A technology which uses slightly modified domestic televisions to access data from a computer database along the telephone lines. Prestel in the UK was the first such system. Australia's version is called Viatel.
Virtual Memory: A technique allowing programs larger than RAM to run. Only part is in memory. Parts are swapped from an online storage device as required.

W

Warm Boot: To reload the operating system a second or subsequent time.
Window: A part of a computer screen which has been divided into sections for displaying distinct information. On some systems which run a number of processes at once, each concurrent process may be displayed in its own window.
Word: The amount of data fetched from one memory location. Typically one byte, but can be two on recent processors.
Word Processor: A system for manipulating, editing, printing and formatting text files.
WordStar: A proprietary word processing program.
Word Wrap: A word processing function which automatically breaks lines exceeding the set right margin limit, and begins placing the words on the next line.
Write Protect: To remove the cover from the notch in a 20 cm floppy disk, so it cannot be written on. With 13 cm mini-floppies, the reverse action (that is, covering the notch) will write-protect the disk.

Z

Z80: A popular 8-bit microprocessor.

SERVICES

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All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by Telephone: Contributors who have modems and suitable software (in the MODEM7/YAM mould – see our stories on Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

Contributions on Disk: Contributions can be accepted in a wide variety of disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm CP/M disks. We can also handle, in-office, Kaypro II and Osborne 13 cm disks, and 13 cm Apple DOS or Apple CP/M disks. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error – if the computer typed it, the computer probably accepted it. Print listings with a dark – preferably new – ribbon on white paper, and try to format the output to a narrow (40-characters) width. If they can't be produced on a printer, borrow a good typewriter – hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies – no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum.

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AD INDEX

A.E.D.	OBC, 17
AID Systems	182
All States Computers	130
Applied Technology	78, 84, 114, 137
Arcom Pacific	74
Australian Micro Solutions	50
Automation Statham	36
AWA Thom	28
Award Software	185
Barson Computers	68
Bee Games	16
Bi-Computer Co	99
Breeze Software	162
Brother	49
CAE	148
Chambers	55
City Personal Computers	10
Classifieds	183
Cole & Associates	164
Commodore	77
Compak	187
Compudat	89
Computer Enterprises	169
Computer Time	32
Computer Trader	161
ComputerMax	94
DataNetComm	21
Datatel	64
Deker Business Machines	132
Dick Smith Electronics	26, 177
EAI	170
Energy Control	89
Entercom	IFC
Exitek	102
Expon	16
Facom	139
Fagan Micro Systems	76
Federal Marketing	115, 116
Fujimex	168
Hewlett-Packard	34
Hi-Tech Software	41
Hills Industries	13
IBM Australia	6, 131
Imagineering	122, 166
Labtam	159
Magnabiz	8
Management Tech	62
Market Directory	188
Merton Scott	15
Micro General	182
Micro-Educational	42
Micromail	178
Mr Floppy	138
Nashua	25, 174
Natwick Management	153
NCR	143, 145
Olivetti	66
Opt Soft	165
Osborne Australia	30, 51, 156
Output Media	125
Pace	180
Pitman Publishing	127
Porchester Computers	154
Qubie	33
Rod Irving Electronics	12
Rose Music	58
Scarlon	61
Seimens	81
Six-S Business Advisory	11
Software Source	5
Software Specialists	152
Software Suppliers	44
System Solutions	146
Telecorp	123
Think Computers	113
Total Solutions	16
Total Solutions	158
Unlimited	158
Utilico	113
Wang	IBC
Your Computer Subscriptions	82

your computer

BLUE STREAKS, RED FACES

The June issue of *Your Computer* won't quite be whitewashed of this month's blue haze — after all, we have our 'almost-IBM' feature which examines the *clones, lookalikes and workalikes*. And it won't just be our study of the alternatives to the IBM PC which casts a blue tint on June — there'll also be the bits we didn't fit in this issue

Yes, despite our blue-blooded May we have *red* faces: some of the things we promised in *Next Month* last month just can't be found in this issue. There's a simple reason, and for a change it's not our failure to get it together: it wouldn't fit (we used to think 196 pages was plenty of space to fill..). So June will have the comprehensive survey of *Hardware Add-ons* for the PC as a follow-up to this month's PC software guide.

We'll try to make up for our sins by cooking up a *bonus treat* — a tear-out, fold-up PC-DOS *reference card*. It will list all the common commands and operating system utilities with examples of their use, and contain all that information you need right beside you at the machine rather than tucked away on a bookshelf. But don't miss out on your June issue or you'll end up having to steal your reference card from a (soon-to-be-former) friend.

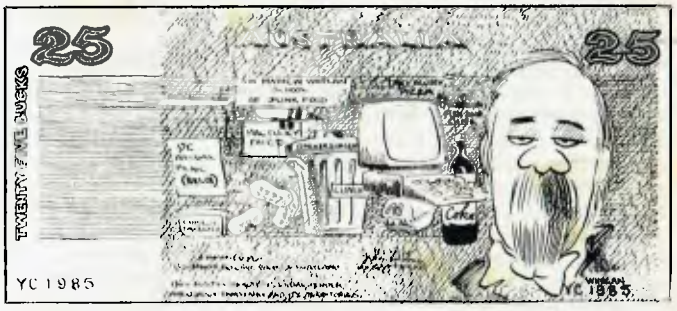
AND MORE . . .

More red faces about more of our super buyers' guides — a major feature in June will be the start of our *Software On The Cheap* series. It will tell you about all the software we can unearth that costs less than $25.

Yes, that too was scheduled for May — when we thought it meant around 200 items, and had that much space reserved for it. At last count, it adds up to nearly 1000 packages without counting the various user group/public domain volumes available! We've sorted it by machine and category to ensure it's an invaluable, easy-to-use reference guide for the software shopper.

Also in June, *The Great Database Search* continues. We have three packages lined up — Superfile, T/Maker and R:Base — but we're not going to promise we'll find room for them all. Red faces make us feel blue

Definite, positive, almost-guaranteed maybe likely possibles scheduled for June include reviews of *WordStar 2000*, the *Commodore 16*, and a packed-full *Bit Bucket*. Then there's Phil Grouse's *Structured Programming*, one of our most talked-about tutorials — one reader even suggested we make it into a 32-page liftout to keep him going the four weeks until his next issue arrived!



Speak Now, or Forever Shut Yer Mouth

This section — which we'll perhaps abbreviate to the *Speak Now Department* in future — is where we warn importers, distributors and manufacturers of what's coming up in future issues so they can tell us about any relevant products or services. That way, you get more information, and we get fewer complaints ("Hello? This is the Lower Slobovian Software Syndicate. Why didn't you list our tooth-pick analyser in your May guide?").

Naturally, we also want to forewarn potential contributors to our upcoming major features so they can: 1) pick up this issue and read the story on Writing For Your Computer; 2) ring and tell us about the wonderful story they have planned; and 3) write the story and get it in early.

First things first, for the suppliers: don't forget Part 2 of Software On The Cheap (July), which covers packages selling from $25 to $50, and Part 3 (August) for the $50 to $100 programs.

Then there's our July issue special, *Unix* (and, along with it, the C Language). And a series of upcoming comparison tests/product surveys — machines under $1000 (Hardware On The Cheap?), machines under $3000, multi-user Supermicros, and more. Which issues? Watch this space for more detail.

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